GALILEO MAKERS: TOYS
CAMP GALILEO
2016 SUPERNOVA ART
(For rising 3rd-5th grade campers)
About Galileo Learning

Galileo Learning (Galileo) creates and operates Innovation Camps for kids. Their mission is “to develop innovators who envision and create a better world” and this mission comes to life each summer at nearly 60 imagination-sparking locations (40 in the Bay Area, 15 in SoCal locations and 4 in Chicagoland.) They also train and employ more than 2100 educators and aspiring educators as summer staff. Galileo's programs serve campers from pre-K through 8th grade.

In all of Galileo's programs, the curricula focuses on helping campers (and staff) develop 21st Century skills and mindsets through understanding and applying the Galileo Innovation Approach (GIA). The GIA is inspired by the Stanford d.school's design thinking process and mindsets and fine tuned for 5-14 year old campers who are especially open to absorbing new ways to think, explore and create. Click here for more information about Galileo Learning.
The Galileo Innovation Approach

The Galileo Innovation Approach (GIA) is our unique approach to teach and learning. It is designed to develop Galileo Innovators – campers and staff who imagine and create a better world. Galileo Innovators approach their work with an Innovator’s Mindset, do their work with an Innovator’s Process, and seek/leverage Innovator’s Knowledge.

Galileo Innovator’s Mindset
Galileo Innovators have dispositions that support breakthrough thinking and creative work. The Galileo Innovator’s Mindset has five elements:

BE VISIONARY
- I envision a better world.
- I imagine things that don’t yet exist.
- I believe that it is my place to turn ideas into reality.

BE COURAGEOUS
- I freely share my creative thoughts.
- I stretch myself to try new things.
- I embrace challenges.

BE COLLABORATIVE
- I value the unique perspectives of others.
- I build on the ideas of others.
- I use my strengths to support the work of others.

BE DETERMINED
- I persevere until I achieve my goal.
- I recognize setbacks as opportunities to learn.
- I know that innovation and mastery require effort.

BE REFLECTIVE
- I take time to think about what is and isn’t working in my design.
- I think about how my work impacts other people and the world.
- I seek feedback to improve myself and my work.
**Galileo Innovator’s Process**

Galileo Innovators learn and practice an iterative process to bring the best ideas to fruition. The following diagram illustrates the Galileo Innovator’s Process:

![Galileo Innovator’s Process Diagram]

**Galileo Innovator’s Knowledge**

Galileo Innovators require subject-specific knowledge to creatively solve problems and make their visions a reality. Galileo Innovator’s Knowledge lies in the following four categories:

**CONCEPTS AND FACTS**

Galileo Innovators understand the big ideas, principles, and facts relevant to their work.

Examples: Adding more tension to a rubber band creates a higher pitch when it’s plucked

**HISTORICAL CONTEXT**

Galileo Innovators understand the contributions, objectives, and processes of relevant movements, artists, scientists, designers, and other experts who came before them.

Examples: Kandinsky uses a variety of brushstrokes and line types to represent music visually

**SKILLS AND TECHNIQUES**

Galileo Innovators understand how to use relevant materials, tools, and technology so they can effectively build, test, and share their ideas.

Examples: Manipulating cardboard by cutting, curling, bending, folding, scoring, tabbing, and fastening; taping techniques; watercolor resist

**AUDIENCE AND ENVIRONMENT**

Galileo Innovators understand the needs, beliefs, and circumstances of their users and the physical context in which their work will be received.

Examples: Engineers need to design buildings in a specific way when constructing in an earthquake prone area
Galileo Innovation Approach and the Curriculum

Our curriculum is designed to support you in teaching the Galileo Innovation Approach and nurturing Galileo Innovators. Below are some ways in which the curriculum fosters your development as an Innovation Educator.

First, you’ll find that the components of the GIA literally leap off the page.

- The GIA terms are emphasized throughout the curriculum in ALL CAPS to help you easily identify opportunities to integrate the GIA.
- An overview of the key Innovator’s Knowledge, Process, and Mindset for each lesson appears on the “Secret Sauce” page. This page clearly spells out the key ingredients that transform each project into an innovation-based Galileo lesson.

Second, the curriculum includes a daily Innovator’s Mindset Challenge. The Mindset Challenge helps campers focus on developing a different part of the Innovator’s Mindset each day and shows how practicing this element can help them develop as innovators. Detailed facilitation notes about how to introduce and support the Mindset Challenge are included as a core part of each lesson.

Third, each day concludes with a Lesson Wrap Up that provides a forum for you to go deep on innovation themes with campers. Prompts are provided to support project sharing, reviewing key Innovator’s Knowledge and debriefing the day’s Mindset Challenge. Use this time to help campers solidify what they learned, notice how practicing the mindset helped them with their project and recognize the innovator in themselves and in others. Familiarize yourself with the discussion questions before each lesson so you can best guide campers to develop as innovators throughout the rotation.

Additionally, these general practices can help you to bring the GIA to life:

- Think about what it means to you to be an Innovation Educator and find ways to realize that vision.
- Pace your class to allow time for campers to engage with each project, giving ample time for the TEST, EVALUATE and REDESIGN phase so that campers can thoughtfully evaluate how they can improve their designs, and then implement the modifications.
- Model the Mindset in your teaching. When you make a mistake, celebrate it! Tell the campers that your teaching or the project didn’t go as planned, and that you’ll learn from that and try it a different way in the next rotation.
- Help campers understand what it means to be a Galileo Innovator and strive to shape their self-images as such.
- Recognize campers as they exhibit the Innovator’s Mindset as relevant throughout the day—in addition to this focus during the Wrap Up. (E.g., I see that you’re BEING REFLECTIVE, thinking about what is and isn’t working with prosthetic hand design. That’s a great way to start developing an innovative solution!)
- Refer to the steps of the Innovator’s Process (and your Galileo Innovator’s Process Poster) as you describe the day’s activities and as campers work.

Finally, the curriculum supports your own innovations for how to integrate the GIA in your classroom. Please apply the Innovator’s Mindset and Process to this end and SHARE your learning with your colleagues!
Kaleidoscopes are a classic toy that capture our imaginations through their ever-changing reflected geometry and intricate beauty. Today’s maker inspiration comes from Clare McGibbon and her DIY Kaleidoscope.

**Today: Building the Kaleidoscope**
Today campers build their kaleidoscopes using mirrors, corrugated paper, craft sticks and cardboard tubes.

![Kaleidoscope Image](image_url)

**What’s Next**
Tomorrow (Day 2) campers create the “art slides” that will be viewed in their kaleidoscopes, manipulating line, shape and color to create different visual effects. On Day 3, campers will use line, shape and color to communicate emotions in a large-scale collage that will be used in a digital kaleidoscope animation. On Days 4 and 5, campers will use iPads to animate their kaleidoscopes.
Today’s Project: At-A-Glance

Tape 3 mirrors in a triangular formation

Three 3 x 6” inch mirrors, taped and folded in triangular formation for interior of kaleidoscope

Wrap mirrors in corrugated paper

Corrugated paper rolled around mirrors and taped to provide padding for mirrors

Tape 3 craft sticks to rolled paper to form a “tripod”

Three craft sticks serve as “tripod” to which art strip “tracks” and “trapper” will be attached
Attach 2 craft sticks to the top and bottom of the tripod with hot glue as “tracks”

Two craft sticks attached to top and bottom tripod legs to make parallel tracks; will hold camper artwork

Attach 2 craft sticks perpendicular to the “tracks” with hot glue as the “trapper”

Two craft sticks attached to tracks; will hold camper work

Nestle the assembled kaleidoscope pieces into a cardboard tube

Kaleidoscope inserted securely into tube
Teaching the Lesson: Overview

OUR SECRET SAUCE: THE G.I.A.

KNOWLEDGE FOCUS

CONCEPTS AND FACTS: How Kaleidoscopes Work
Campers understand that kaleidoscopes are constructed in a specific way to reflect an image, and internalize this concept by building their own.

Why? – Campers need to have the background knowledge of how kaleidoscopes work in order to understand why each step in the building process is important for the toy’s functionality. Additionally, it is possible campers may have never used a kaleidoscope and may not have context for what things are the most important.

PROCESS FOCUS

CREATE: Maker’s Checklist
Campers work with a checklist that outlines the kaleidoscope construction steps and their key points for success.

Why? – Building a kaleidoscope involves many steps that need to be followed carefully. Using a checklist will support campers in staying focused on completing the tasks and self-assessing whether they have done quality work.

MINDSET FOCUS

BE DETERMINED – I know that innovation and mastery require effort.
Campers commit to a high level of craftsmanship and are determined to put their best efforts towards building a solid kaleidoscope.

Why? – It can be hard to stay excited about a step-by-step task if you can’t see the benefit right away. This challenge supports campers in setting themselves up for success in the future by doing quality work today, so they will be able to enjoy their kaleidoscopes tomorrow.

Remember to include these special ingredients to transform today’s project into a Galileo, innovation-based lesson. Bam!
Lesson Breakdown & Camper Goals

<table>
<thead>
<tr>
<th>Activity</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Welcome to Art</td>
<td>10 min</td>
</tr>
<tr>
<td>Introduction</td>
<td>5 min</td>
</tr>
<tr>
<td>Demo &amp; Discussion: Building a Kaleidoscope &amp; Maker’s Checklist</td>
<td>15 min</td>
</tr>
<tr>
<td>☐ Introduce the Maker’s Checklist</td>
<td></td>
</tr>
<tr>
<td>☐ Quickly demo each step of building the kaleidoscope</td>
<td></td>
</tr>
<tr>
<td>☐ Introduce the Kaleidoscope Exploration Station</td>
<td></td>
</tr>
<tr>
<td>Independent Work Time: Building Kaleidoscopes</td>
<td>25 min</td>
</tr>
<tr>
<td>☐ Assemble mirrors</td>
<td></td>
</tr>
<tr>
<td>☐ Wrap mirrors in corrugated paper</td>
<td></td>
</tr>
<tr>
<td>☐ Assemble tripod legs</td>
<td></td>
</tr>
<tr>
<td>☐ Assemble tracks and trapper parts</td>
<td></td>
</tr>
<tr>
<td>☐ Nestle the kaleidoscope in a cardboard tube</td>
<td></td>
</tr>
<tr>
<td>☐ Test out the kaleidoscope at the Exploration Station if time allows</td>
<td></td>
</tr>
<tr>
<td>Clean Up</td>
<td>5 min</td>
</tr>
<tr>
<td>Wrap Up</td>
<td>10 min</td>
</tr>
</tbody>
</table>

Timing Notes

Campers are on track so long as they’ve completed the kaleidoscope construction and they’ve performed the “Self-Check” items on the Maker’s Checklist to confirm they’ve done quality work.

If campers or groups are behind
- Have campers who have finished early help their teammates who are struggling.
- Help campers finish up their kaleidoscopes.

If campers or groups are ahead
- They can observe different objects through their kaleidoscope at the Exploration Station.
- They can help campers who are struggling or working more slowly.
**Teaching the Lesson: Play-by-Play**

### Welcome to Art (10 min)

<table>
<thead>
<tr>
<th>Welcome campers, introduce the theme, and make a quick story connection</th>
<th>Ex: Did you hear a story about Lucy and Finn this morning? How are they doing? (Not great. EvilleMart stole their toy for ToyFest.) Oh no! Fortunately, there’s no shortage of innovative toy ideas in the world. Let’s use our artistic vision to bring some to life right now—maybe we can even inspire Lucy and Finn’s next project.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set expectations about the space and materials</td>
<td>Important to set clear expectations for the whole week</td>
</tr>
<tr>
<td>Go over daily procedures you’ll want campers to be familiar with; some ideas</td>
<td>• What they do when they first come in</td>
</tr>
<tr>
<td>• What materials they can and can’t touch</td>
<td>• How they treat plastic (leave it on; don’t poke holes in it!)</td>
</tr>
<tr>
<td>• How they treat materials</td>
<td>Where they put finished projects</td>
</tr>
<tr>
<td>Set expectations about behavior in the classroom</td>
<td>Come up with agreements about</td>
</tr>
<tr>
<td>• How everyone can stay safe</td>
<td>• How campers can make sure they all have fun</td>
</tr>
<tr>
<td>Emphasize respecting you, other staff, and each other</td>
<td></td>
</tr>
<tr>
<td>Introduce the GIA</td>
<td>Introduce the idea of being an innovator</td>
</tr>
<tr>
<td>• Ex: We’ll be learning about art all week, and we’ll also be practicing being innovators. Being an innovator is a really important job. Innovators think of really great ideas and can make those ideas real!</td>
<td></td>
</tr>
<tr>
<td>Point out your Innovator’s Process poster and quickly intro the Process</td>
<td>• Don’t go over each step in detail now</td>
</tr>
<tr>
<td>• Ex: These are the steps that good innovators follow to help them make amazing creations. They come up with a lot of ideas, test them out, and redesign to make them better.</td>
<td>Point out your Innovator’s Mindset poster and intro the Mindset</td>
</tr>
<tr>
<td>• Again don’t go over each Mindset element in detail now</td>
<td>• Ex: This is how good innovators think and act. They try new ideas, they work together, and they don’t give up!</td>
</tr>
<tr>
<td>Ask campers if they’re ready to innovate!</td>
<td></td>
</tr>
</tbody>
</table>

### Introduction (5 min)

<table>
<thead>
<tr>
<th>Introduce the idea of makers and making</th>
<th>Announce this week is all about makers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Makers are people who make things themselves</td>
<td>Makers know they don’t have to go to a toy store to get toys or be part of a big toy company; anyone can be a toy maker!</td>
</tr>
<tr>
<td>• There are all kinds of makers</td>
<td>• Game makers, tool makers, clothes makers, food makers, etc.</td>
</tr>
<tr>
<td>This week campers will be toy makers who make their own toys!</td>
<td></td>
</tr>
</tbody>
</table>

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10

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### Give context for today's project: Introduce kaleidoscopes and how they work

- Hold up the manufactured kaleidoscope
- Ask: *What is this awesome device?*
  - Kaleidoscope is a scientific instrument
- Have campers pass around and check out the manufactured kaleidoscope
- Ask: *How do kaleidoscopes work?*
  - Multiple mirrors inside
  - Mirrors reflect objects/artwork into different lines of symmetry

### Build excitement and give an overview of today's project

- Introduce a week full of kaleidoscope exploration! Will have an actual, physical kaleidoscope as well as a digital kaleidoscope animation
  - Monday: Building kaleidoscopes
  - Tuesday: Creating "art strips" for kaleidoscopes
  - Wednesday: Create the art to use in digital kaleidoscope animations
  - Thursday: Create stop motion animation videos of kaleidoscope art
  - Friday: Animation redesign day

- Today we’re going to build our own kaleidoscopes!
  - Show sample prepared kaleidoscope with sample strip art
  - Must be made with care for device to work properly
  - Important that we follow all steps carefully; will go step by step

### ★ Introduce the Innovator’s Mindset: BE DETERMINED

- Point to this on your Innovator’s Mindset poster
- Define the Mindset element in the context of today’s lesson
  - *Today we’re going to focus on being determined. This means knowing that sometimes creating something awesome we can play with requires a lot of detailed work to get the basics down before we can experiment or create more freely. Today we will commit to working carefully and thoroughly so that our kaleidoscopes are sturdy and work properly. Our efforts today will really pay off tomorrow.*

### Introduce campers to a maker who created her own version of today’s project

- Show today’s Maker Connection color copy for inspiration
  - Read the maker’s name and quickly describe the project
  - Pick one of the Q&As and share it with campers now
    - Explain these are things the maker wanted to share with campers to inspire them as they make toys all week
    - If necessary rephrase or sum up in age-appropriate language
    - You can read the other Q&A as campers work or if you have extra time later in the week
  - Have campers give a thumbs-up if they’re psyched to make their own toys like this maker!
## Demo & Discussion

### Building a Kaleidoscope & Maker’s Checklist (15 min)

<table>
<thead>
<tr>
<th>Introduce the Maker’s Checklist as a tool that campers will use to support quality construction</th>
<th>Explain that you will give a quick demo of each step of building the kaleidoscope for context. Then campers will work on their own at the table groups. Will use a Maker’s Checklist poster to keep them on track; call out the important parts about each step.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Checklist has: • Pictures • Written steps • Maker’s Self-Check; this is a step to help them stay committed to high quality work.</td>
<td>Kaleidoscopes are awesome, but only when they are built correctly so they work! Important to pay close attention to each step so they can enjoy their kaleidoscopes once they create artwork to view inside. Because they’re building on their own, it’s up to them to self-check using the Maker’s Checklist. Call out as an opportunity to choose: • Not practicing being determined – Not working carefully to be sure that they’ve completed the step correctly before moving on; taking an “it’s good enough” attitude when there is still room for improvement. • Practicing being determined – Working with attention and focus; following the steps on the checklist; being honest with themselves if they’ve done the step correctly, and if not, redoing it with more care. Encourage looking out for this opportunity and exercising the power of determination.</td>
</tr>
<tr>
<td>★ Introduce the opportunity to practice BEING DETERMINED while constructing their kaleidoscopes.</td>
<td>Call out that the mirrors create the kaleidoscope’s geometric reflections. Remind campers that steps can be followed on the picture instructions. • Arrange the 3 mirrors, vertically, reflective side down. • Space the mirrors about ¼” apart (to allow room for bending into triangular shape). • Connect the three rectangles with pieces of horizontal tape at the top, middle and bottom. • This will look like 3 bridges that span the 3 mirrors.</td>
</tr>
<tr>
<td>Quickly demo taping together the 3 rectangular mirrors (Part 1: Mirrors)</td>
<td></td>
</tr>
</tbody>
</table>

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Licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License.
Quickly demo folding taped mirrors into a triangular formation  
(Part 1: Mirrors)

Call out “Flip it over!” so reflective side is up
Fold up the two outside rectangular sections to make a triangular form
Use three pieces of tape to secure the mirrors in triangular form
<table>
<thead>
<tr>
<th>★ Model BEING DETERMINED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do a Self-Check of Part 1</td>
</tr>
</tbody>
</table>

Call out opportunity to use Maker’s Checklist to help with being determined
- **Ex:** *What are the things I should look for to be sure that I’ve done a good job on my mirrors?*

Model self-inspection of the following:
- Mirrors are in triangular formation
- Mirrors are on the inside and reflect when I look through them
- The tape feels sturdy and secure
- **Ex:** *Am I ready to move on to the next step?*

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<table>
<thead>
<tr>
<th>Quickly demo wrapping triangular mirrors with corrugated paper</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>(Part 2: Paper Wrapper)</em></td>
</tr>
</tbody>
</table>

Call out that the corrugated paper will help cushion the mirrors and make them fit snugly into the cardboard tube
Lay the corrugated paper bumpy side up
Place the mirrors close to one end of the paper
Make sure they are lined up straight
Attach the paper to the mirrors with 3 pieces of tape (like the tape on the mirrors)
Flat on the table, roll the paper around the mirrors
Push down gently as you roll to keep the paper taut
Use 3 pieces of tape to secure the wrap in place

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<table>
<thead>
<tr>
<th>★ Model BEING DETERMINED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do a Self-Check of Part 2</td>
</tr>
</tbody>
</table>

Call out the opportunity to use the Maker’s Checklist to help with being determined
- **What are the things I should look for to be sure that I’ve done a good job on my corrugated paper wrapping?**

Model doing a self-inspection of the wrapping
- Confirm that the paper was taped to the mirrors
- Check that the paper is wrapped tightly
- Confirm that the paper is taped to hold it tightly
- **Am I ready to move on to the next step?**

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<table>
<thead>
<tr>
<th>Quickly demo taping 1 craft stick to the top point of the paper-wrapped mirrors</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>(Part 3: Craft Stick “Tripod”)</em></td>
</tr>
</tbody>
</table>

Call out that the next few steps will create the “tripod” (3-legged stand that will help hold the art strips)

Put the wrapped mirror down flat

Attach a craft stick onto the corrugated paper directly above the triangle point:
- **Put 2 pieces of tape on one end of the craft stick**
Quickly demo adding two craft sticks to the base of the paper wrapped-mirrors
(Part 3: Craft Stick “Tripod”)

- Attach with about half of the craft stick hanging over the edge of the corrugated paper
- Rub tape to secure

Lay 2 craft sticks on the table, parallel and 2 inches apart

Apply two horizontal pieces of tape across the center and end of the two craft sticks

Flip the sticks over so they are sticky tape side up

Position the base of the mirrors over the sticks so half of the craft sticks extend out from the base

Press down gently to adhere tape

Rub tape down to secure
Call out the opportunity to use the Maker’s Checklist to help with being determined

- What are the things I should look for to be sure that I’ve done a good job on my tripod?

Model doing a self-inspection of the tripod
- Confirm top craft stick is above the point
- Confirm 2 bottom craft sticks lay flat at the base
- Confirm all three have about half sticking out
- Confirm all three are taped securely
- Am I ready to move on to the next step?

Make the “tracks” that the art strips will slide in and out of

Lay the kaleidoscope down flat on the table

Add a dot of hot glue to each of the two craft sticks at the base, right next to the corrugated paper

Glue a craft stick horizontally across the two base sticks
Flip it over

Add dot of hot glue to the craft stick at the triangle point, right next to the corrugated paper

Glue a craft stick horizontally across the top stick – should be parallel to the other craft stick just glued

[Image of a structure made from craft sticks and corrugated paper with hot glue applied]
Use a 3 x 5.5" transparency strip (“testing strip”) to make sure it slides well

<table>
<thead>
<tr>
<th>Introduce hot glue gun safety</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot glue is great for creating strong bonds that dry fast; can also be dangerous if they’re not careful</td>
</tr>
<tr>
<td>Instruct campers to avoid burns by:</td>
</tr>
<tr>
<td>• Keeping fingers away from the metal tip</td>
</tr>
<tr>
<td>• Applying glue to the larger surface, especially if the material they’re gluing on is tiny</td>
</tr>
<tr>
<td>• Not touching fresh glue; waiting 30 seconds before touching hot glue</td>
</tr>
<tr>
<td>• Waiting patiently for their turns; never grabbing the glue gun</td>
</tr>
<tr>
<td>• Always putting glue guns back on cardboard, plates, or trays when done (also important for avoiding burning tables)</td>
</tr>
<tr>
<td>If they do get burned they should:</td>
</tr>
<tr>
<td>• Run the burn under cold water until it stops hurting</td>
</tr>
<tr>
<td>• Get an ice pack from the office if it’s still hurting</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Quickly demo attaching the craft stick “trapper” to the “tracks” and “tripod”</th>
</tr>
</thead>
<tbody>
<tr>
<td>A “trapper” will hold the art strips in place</td>
</tr>
<tr>
<td>Demo how the art strips will slide back and forth on your sample kaleidoscope; point out that the tracks and trapper keep the strip moving in a straight path</td>
</tr>
</tbody>
</table>
Add a ½" strip of hot glue to each end of a craft stick
Attach the craft stick to the top and bottom track on the left side
Repeat for the opposite side
Test with testing strip to make sure it slides well and stays inside the frame

Call out the opportunity to use the Maker’s Checklist to help with being determined

- What are the things I should look for to be sure that I’ve done a good job on my tracks and trapper?

Model self-inspection:

- Inspect bottom track attached close to the paper wrapper
- Inspect top track attached close to the paper wrapper
- Inspect both sides of the “trapper”; is it well glued?
- Test with the testing strip
- Am I ready to move on to the next step?
Quickly demo sliding the kaleidoscope into the outer tube

(Part 6: Add Tube)

The outer tube helps keep all the kaleidoscope parts together and makes it more comfortable to hold and use

- Ease the kaleidoscope into the cardboard tube
- Squeeze the corrugated paper and the tripod base sticks if needed to fit it in the tube
- Remind campers to work with patience and be gentle

Introduce the Kaleidoscope Exploration Station

Point out the Exploration Station

Campers can go to the station when they are done to look at different objects through their kaleidoscopes

Demo using your kaleidoscope to look into a deli container filled with different items

★ Ask campers to take on the challenge of BEING DETERMINED

Have campers hold an imaginary checklist in one hand, and an imaginary pencil in the other

Ask them to take on the challenge of being determined and commit to following the Maker’s Checklist so that they can work with effort and attention to create amazing kaleidoscopes

If they accept the challenge, have them make a giant checkmark in the air with their imaginary pencils
# Independent Work Time

## Building Kaleidoscopes (25 min)

<table>
<thead>
<tr>
<th>What campers will do: Use the Maker’s Checklist to construct a kaleidoscope</th>
<th>CREATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Follow the Maker’s Checklist posters to construct the kaleidoscope.</td>
<td></td>
</tr>
<tr>
<td>2. Assemble the mirrors.</td>
<td></td>
</tr>
<tr>
<td>3. Wrap the mirrors in corrugated paper.</td>
<td></td>
</tr>
<tr>
<td>4. Assemble the tripod legs.</td>
<td></td>
</tr>
<tr>
<td>5. Assemble the tracks and trapper parts.</td>
<td></td>
</tr>
<tr>
<td>6. Nestle the kaleidoscope in a cardboard tube.</td>
<td></td>
</tr>
<tr>
<td>7. Test out the kaleidoscope at the Exploration Station if time allows.</td>
<td></td>
</tr>
</tbody>
</table>

### Facilitate CREATE

Remind campers to rely on the Maker’s Checklists to help them self-assess if they have done each step correctly before moving on.

Support campers with hot glue station management:

- Make sure campers aren’t crowding the station and are only using a dot of glue at a time.
- Make sure campers are only hot-gluing the parts that call for it.
- Replace glue sticks as needed.

Help support time management; give campers a heads-up when they should be about halfway done and when they should be wrapping up.

### ★ Support BEING DETERMINED

Remind campers to be honest in their self-assessments and be ready to redo any steps as necessary to help them have greater success.

Recognize determined campers; be specific about how they are being determined.

Ask guiding questions that support being determined:

- *Tell me what things you are looking for on this step to make sure you’ve done a good job.*
- *How is the Maker’s Checklist helping you?*
- *What things have you had to redo? What steps have been difficult?*
- *Why is it important to do a good job with this part of the kaleidoscope?*

### Clean Up (5 min)

<table>
<thead>
<tr>
<th>Clean Up</th>
<th>Supplies are organized neatly at table groups</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Make sure all projects have names on them</td>
</tr>
<tr>
<td></td>
<td>Collect one camper project to use during the Wrap Up</td>
</tr>
</tbody>
</table>
### Lesson Wrap Up (10 min)

| ★ Have campers share how they were DETERMINED and discuss the importance of BEING DETERMINED | Hold up a finished kaleidoscope; recognize how many steps campers had to complete to successfully build their kaleidoscopes  
Have campers make a check mark in the air if they had to practice being determined to get some part of their kaleidoscopes just right  
Have a few share what they had to persevere through and what they decided to do using the power of determination  
Others can give “me-too” signal if they had similar experience  
Help campers see value of Mindset; ask:  
• How did being determined help you get through all the steps?  
• Why do you think being determined is important for innovators?  
• What other projects or activities do you do where it’s important to be determined?  
• Can you imagine another scenario when creating a checklist could be helpful in reaching a goal? |
| Revisit today’s maker connection | Remind campers about the toy maker they learned about earlier  
Ask: Do you think this maker had to be visionary when making her toy? How?  
If there’s a relevant Q&A read/revisit it now |
| ★ Invite campers to recognize each other for BEING DETERMINED | Can recognize teammates they saw being determined or who helped them be more determined  
Encourage specificity about how person was determined  
You and TL can recognize campers as well |
Get Ready!

Lesson Materials

* (starred) materials appear multiple times in this list

Copies

☐ poster, Maker’s Checklist (2 per classroom)
☐ copy, color, Maker Connection (2 per classroom)

General/Adhesives/Tools

☐ glue gun, mini, low temp, for hot gluing “tracks” and “trapper” frame (1 per 4 campers)
☐ glue stick, melt, mini, for hot gluing “tracks” and “trapper” frame (1 per 4 campers)
☐ tape, masking, 1”, for taping mirrors, corrugated paper, tripod (60” per camper)

Required Materials

Kaleidoscope building

☐ craft stick, regular, 3/8 x 4.5", for tracks and trapper (7 per camper)
☐ tube, cardboard, 4 x 7", for outside of kaleidoscope (1 per camper)
☐ mirror, rectangular, acrylic, 3 x 6" (3 per camper)
☐ paper, corrugated, brown, roll, 6" wide, for kaleidoscope wrapping (one 6 x 30" piece per camper)
☐ kaleidoscope (store-bought), for demo (3 per classroom)
☐ transparency, film, copier, 8.5 x 11", for testing (one 3 x 5.5" strip per 4 campers)

Kaleidoscope Exploration Station

☐ container, plastic, deli, 8 oz., for holding misc. objects for kaleidoscope viewing (1 per 4 campers)
☐ miscellaneous sequins, beads, paper scraps, for kaleidoscope viewing (roughly 15 per deli container)

Materials Preparation

Cut corrugated paper into 30 inch lengths for paper wrapping (1 per camper, 1 for demo).

- Measure and mark 30 inches on a table with 2 pieces of blue tape.
- Mark off 30” increments on the paper roll with a marker using the taped table to measure.
- Pull the marked roll through the paper cutter and cut the 30” pieces.

Build a sample kaleidoscope following the instructions in the curriculum and on the Maker’s Checklist.

Cut sample “test strips” of transparency paper for campers to test sliding through the “tracks” and “trapper” of their kaleidoscopes (one 3 x 5.5" strip per 4 campers).

- Important to cut these accurately so the art strips slide easily in kaleidoscopes
- Use paper cutter, cutting 2-3 sheets at a time
- Cut in half lengthwise to make 8.5 x 5.5" sheets

5.5" 5.5"

- Cut half sheets into 3 x 5.5" strips (2.5" extra can be discarded)

3 3 3
Setting Up the Space

Set the kaleidoscope materials at the center of each workstation:
- rolls of masking tape (2 per table, campers can cut if they are having a hard time ripping)
- 4 x 7” cardboard tube (1 per camper)
- 3 x 6” acrylic mirrors (3 per camper)
- 6 x 30” corrugated paper (1 per camper)
- craft sticks (7 per camper)
- 3 x 5.5” “test strip” of transparency (1 per 4 campers)

Set up hot glue stations around the room, close to table groups if you can (1 hot glue gun per 4 campers). Place a piece of cardboard or a paper plate under each glue gun to catch drips and protect the plastic on the table.

Set up a Kaleidoscope Exploration Station at a table or on the floor somewhere out of the way.
- Gather objects or materials you have handy that might be interesting to look at through kaleidoscopes (sequins or beads, fabric, scraps of colored paper, etc.).
- Place the objects in the 8 oz. deli containers (1 per 4 campers, or 4-6 at a station) at random.

Gather materials for the Demo & Discussion:
- set of kaleidoscope materials (same as at camper workstations) including tape and accessible hot glue

Morning Of Preparation

Plug in the glue guns to warm up.

Notes

Suggestions for Large Classes
Set up hot glue stations at table groups, if possible.

On the Board

Mindset of the Day
DETERMINED – I know that innovation and mastery require effort.

Check In With Your TL

➤ Make sure your TLs are clear about their role in helping today’s lesson run smoothly. Specific things your TL can help with today:
- Watch how campers are doing with taping during the Independent Work Time and help as necessary
- Help with hot glue reinforcements as campers finish
Day 2: Kaleidoscopes, Part 2 of 5

Today: Creating Kaleidoscope Art
Today campers will create the art strips they will view through their kaleidoscopes. Campers will experiment with manipulating the elements of art (line, shape and color) to discover designs that look awesome in their kaleidoscopes.

What's Next
Tomorrow (Day 3) campers will use line, shape and color to communicate emotions in a large-scale collage that will be used in a digital kaleidoscope animation. On Days 4 and 5, campers will use iPads to animate their kaleidoscopes.
Today’s Project: At-A-Glance

Use prompts on the Art Strip Design Planning sheet to plan four different designs.

Four different design ideas on Art Strip Design Planning sheet

Cut tissue paper into chosen shapes for the first design and glue to a clear strip.

Cut colors/shapes of tissue paper that fits design choice; glue to clear strip

Attach a top layer of tracing paper to the strip.

Cut tissue shapes “sandwiched” between the clear strip and the tracing paper.
Add lines, details and patterns with Sharpie.

Completed composition with Sharpie details, in chosen color and line type.

Repeat the process to create all four art strips according to the design plan.

Example of 4 art strips created using different design prompts.

Tape strips together to make one long strip.

Completed art strips, taped together and loaded in kaleidoscope.
Teaching the Lesson: Overview

OUR SECRET SAUCE: THE G.I.A.

KNOWLEDGE FOCUS

CONCEPTS AND FACTS: Elements of Art
Campers learn that line, shape and color are considered key elements of art that can be expressed and combined in many ways. They use these elements to create abstract art for their kaleidoscopes.

Why? – While the concept of line, shape and color will not be new to many Supernovas, thinking about them as fundamental art elements may be a different approach. Campers need to understand that while experimenting with these elements might seem basic, it’s actually a valuable tool for creating all kinds of art and can yield visually interesting results.

PROCESS FOCUS

DESIGN: Designing with Prompts
Campers make design choices guided by prompts to help them break out of their comfort zones and come up with four very different combinations of line, shape and color.

Why? – It can be hard for campers to move outside their comfort zones, or to get ideas for how to try something new. Giving campers prompts to help them arrive at line, shape and color decisions will allow them to come up with a broader range of results. Additionally, making decisions based on prompts is quick and will support campers in generating more artwork.

MINDSET FOCUS

BE COURAGEOUS – I stretch myself to try new things.
Campers stay open to creating four completely new and different design ideas, going beyond the kinds of lines, shapes and colors they normally use, and letting go of the outcome.

Why? – Campers may be tempted to make the kinds of lines or shapes which are pleasing or familiar to them. Challenging campers to embrace the design combinations that the design prompts help them create (even if they seem strange) and let go of the outcome will keep them rooted in the exploration phase and allow for a wider range of designs.

Remember to include these special ingredients to transform today’s project into a Galileo, innovation-based lesson. Bam!
# Lesson Breakdown & Camper Goals

<table>
<thead>
<tr>
<th>Introduction</th>
<th>5 min</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Guided Activity: Line, Shape, Color</strong></td>
<td>20 min</td>
</tr>
<tr>
<td>□ Define abstract art and discuss line, shape and color</td>
<td></td>
</tr>
<tr>
<td>□ Guide campers to fill out the Art Strip Design Planning sheet for their art strips using prompts</td>
<td></td>
</tr>
<tr>
<td>□ Demo creating an art strip based on design prompts using tissue paper and Sharpie</td>
<td></td>
</tr>
<tr>
<td><strong>Independent Work Time: Creating Kaleidoscope Art Strips</strong></td>
<td>30 min</td>
</tr>
<tr>
<td>□ Cut and glue tissue paper shapes to the clear strip</td>
<td></td>
</tr>
<tr>
<td>□ Add a layer of tracing paper on top of the tissue paper shapes to seal them in</td>
<td></td>
</tr>
<tr>
<td>□ Use Sharpie to draw lines and designs on the clear strip</td>
<td></td>
</tr>
<tr>
<td>□ Test out the completed slide in the kaleidoscope</td>
<td></td>
</tr>
<tr>
<td>□ Repeat to create the remaining three art strips</td>
<td></td>
</tr>
<tr>
<td>□ When finished, tape all four slides together into a long strip</td>
<td></td>
</tr>
<tr>
<td><strong>Clean Up</strong></td>
<td>5 min</td>
</tr>
<tr>
<td><strong>Wrap Up</strong></td>
<td>10 min</td>
</tr>
</tbody>
</table>

## Timing Notes
Campers are on track so long as they have created at least three strips of kaleidoscope art.

If campers or groups are behind

- Three strips are okay.

If campers or groups are ahead

- Campers can continue to experiment and make additional art strips.
Teaching the Lesson: Play-by-Play

Introduction (5 min)

| Build excitement and give an overview of today’s project | Today they will create the art that they will view with their kaleidoscopes!
They will use a collage technique to make 4 very different art strips to slide through the kaleidoscope
Each will be an experiment with line, shape and color to create cool effects; creating the artwork today is also like a brainstorm for tomorrow’s large-scale artwork |
| --- | --- |
| ★ Introduce the Innovator’s Mindset: BE COURAGEOUS | Point to this on your Innovator’s Mindset poster
Define the Mindset element in the context of today’s lesson
• Today we’re going to focus on being courageous. This means that we will embrace the challenge of creating art in a way that may be new to us and forget about worrying whether it looks “good” or not. Sometimes going outside your comfort zone and staying in the experimenting zone leads to awesome discoveries; we’ll be able to use these discoveries in our artwork tomorrow. |

Guided Activity

Line, Shape, Color (20 min)

| Define and discuss abstract art and the elements of line, shape, and color | Abstract art is using a combination of lines, shapes and colors to make compositions, or pieces of art
• Often it’s not anything recognizable
• Doesn’t need to “look” like anything in particular, but that doesn’t mean that artists aren’t thoughtful about what they create
There are 7 elements of art; line, shape, color are three very important ones
• Artists pay attention to these three elements regardless of the kind of art they are making
• These elements can be combined and highlighted in many different ways
Share Kandinsky’s Yellow-Red-Blue as sample of abstract art that uses line, shape and color |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Have campers briefly share what they notice about the artwork</td>
</tr>
</tbody>
</table>
Define and discuss collage

Collage is an art technique where the artwork is made with an assembly of a variety of materials

Often use different kinds of paper, fabric, 3D materials, ribbons, paint, photographs, etc.

Today campers will create a simple collage with tissue paper and markers

Discuss line using the Line Reference Sheet

Point out different types of lines in Kandinsky’s work (straight, curvy, arcs)

Have campers look at the Line Reference Sheet copy and share different kinds of lines they see (straight, curvy, zigzag, spiral, etc.)

Discuss shape using the Shape Reference Sheet

Point out different types of shapes in Kandinsky’s work (circles, triangles, squares, polygons)

Have campers look at the Shape Reference Sheet and share different kinds of shapes (triangles, rectangles, ovals, circles, polygons, blobs, etc.)

Discuss color using the Color Reference Sheet

Point out colors on Kandinsky art sample (yellows on left, reds in center, blues on right)

Have campers look at the Color Reference Sheet and share the primary and secondary colors
Introduce complementary colors; have campers point them out
• Colors opposite on color wheel
• Artists use these two together to make their art “pop”!

Introduce warm and cool colors; have campers point them out
• Yellow, orange, red are warm
• Green, blue, purple are cool

Introduce the term “monochromatic”
• Uses only one color
• Black and white are particularly powerful

Kandinsky combined many different types of lines, shapes and colors in his artwork

Today they will experiment with singling out just one type of line, shape, and color scheme for each of 4 kaleidoscope art slides

To get our ideas flowing we will use design prompts
• A prompt is a suggestion or guideline
• Using a prompt can help you think of options you might not think of on your own
• Help us narrow our ideas from the many possibilities with line, shape and color

Choosing to only use one type of shape or line, or a certain color scheme will create different looks and effects for kaleidoscope art

Our goal is to push ourselves to come up with four very different strips
• Try things we wouldn’t normally
• Stay experimental
• Maybe even try things we don’t think we’ll like

This will help us come up with interesting outcomes and have more ideas to work with tomorrow

Call out as an opportunity to choose:
• Not practicing being courageous – avoiding trying new ways of making art; working too hard to make the “perfect” slide; not following the design prompt because you don’t think you’ll like the outcome
• Practicing being courageous – embracing the design prompt challenge; being open to surprises; trying a design idea even if you’re not sure how it will turn out; trying something you’ve never done before
Support DESIGN and review the four design prompts on the Art Strip Design Planning sheet

Show the sheet and review the prompts:
- Strip 1: Line, shape, color you like
- Strip 2: Line, shape, color you don’t normally use (or the opposite of your first choice)
- Strip 3: Close your eyes and pick from the reference sheets
- Strip 4: No repeats! Try something totally new

Encourage campers not to get too caught up in what the line, shape, color combination might look like together, and just to focus on the prompts.

★ Model BEING COURAGEOUS as you demo choosing line, shape, and color based on the design planning sheet

Point out that Strip 1 doesn’t require tons of courage, but the other three might be more difficult to know what the outcome will be

Model making choices for Strip 2 based on the design prompts that encourage being courageous
- Ex: Geez, well, I would ordinarily never choose the color combination of orange and lime green, so I’ll give these colors a try in my strip #2. Also I usually draw curvy, soft lines and shapes, so I’m going to choose zig zag and angular shapes. I have no idea what this will look like!

Support DESIGN

Have campers fill out the Art Strip Design Planning sheet

Campers will have just a few minutes to quickly generate ideas on the design planning sheet; emphasize that this is a fast exercise

Distribute pencils and Art Strip Design Planning sheets

Campers can draw the lines/shapes and write the colors

Remind campers they can use the Line, Shape and Color reference sheets for inspiration

At approximately 30 second intervals, prompt campers to move on to the next art strip design

If your campers finish particularly quickly, have them share one of the designs they are most unsure about with a neighbor

Have campers put their sheets on the floor in front of them

Demo how to start the collage with shapes by using three pieces/colors of tissue paper

Now you’ll demo how campers will make their choices into a collage

Campers will start by creating the shapes they’ve chosen for that particular strip

Pick three pieces of color tissue that fit chosen color scheme

With all 3 sheets held together, cut out one large shape of chosen design (to make 3 pieces)

Call out that small shapes are difficult to manage; larger shapes are the goal

Scraps can be used to make smaller versions of the same chosen shape
Use a glue stick to spread an even layer of glue on one side of a 3 x 5.5" strip

Add cut tissue shapes one at a time

Model being courageous
  • Demo being thoughtful about the composition, but remind them that this is all about experimenting, and they are mostly creating as they go
  • Ex: I’m not exactly sure where this is going, but I like how the shapes look when they are layered. Maybe I’ll try adding a different version of this shape as well.

Shapes can be layered in ways that create new shades of the colors

Cut additional shapes if needed

Add a piece of 3 x 5.5” inch tracing paper to the gluey side of transparency to seal in the tissue paper shapes

Add extra glue to edges/corners if needed to adhere properly
**Model BEING COURAGEOUS as you demo adding Sharpie lines and designs to the clear strip and staying experimental**

Flip the art slide over so the transparency (clear) side is up

Remind campers that abstract art doesn’t need to “look” like anything in particular

They can try adding lines in lots of different ways and see what they like, it’s okay if they don’t like everything they try!

Use Sharpie to add lines to the design

- Model choosing colors to fit the chosen color schemes
- Draw lines/shapes that match the design prompt choices
- Show how chosen lines can fill in the shapes, outline the shapes, fill in white areas

**Model being courageous**

- Ex: *I don’t usually make anything that looks like this, but it’s kind of cool. However, I don’t like the lines over here, but that’s okay, it gave me a different idea*
- Reinforce the idea that they aren’t trying to end up with a final piece that looks “good” together as a whole
- There can be parts of the strip that they like and parts that they don’t

**Demo testing the slide in the kaleidoscope**

Briefly test the slide in a sample kaleidoscope, observing the effects made by the lines, shapes, colors

Remind campers to hold it up to the light for the best effect
<table>
<thead>
<tr>
<th>Discuss taping all four strips together</th>
<th>Call out that after a quick test, campers should stay on task to work on their 2nd, 3rd, and 4th slides</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Point out that parts of the slide they may not have liked actually look really awesome in the kaleidoscope!</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Discuss taping all four strips together</th>
<th>Once they are finished, all four strips can be taped together to make a long strip with lots of variety to view in the kaleidoscope</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Can think about what strips they want to be next to each other</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Discuss taping all four strips together</th>
<th>Think about the viewing experience</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>★ Ask campers to take on the Mindset Challenge: BE COURAGEOUS</th>
<th>Remind campers that as they work they should let go of perfectionism in exchange for a spirit of experimentation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>As they work they may feel like things aren’t turning out in a way like they like, or that it looks/feels “weird”</td>
</tr>
<tr>
<td></td>
<td>Present challenge: <em>When this happens you have the choice to shy away from the unknown, or use your powers of being courageous to stretch yourselves to try working in a way that’s new to you.</em></td>
</tr>
<tr>
<td></td>
<td>Have campers take a giant, courageous belly breath of experimentation if they accept your challenge</td>
</tr>
</tbody>
</table>
Independent Work Time
Creating Kaleidoscope Art Strips (30 min)

<table>
<thead>
<tr>
<th>What campers will do: Follow the Art Strip Design Planning sheet to make four different art strips for their kaleidoscopes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CREATE</td>
</tr>
<tr>
<td>1. Refer to the Art Strip Design Planning sheet for Strip #1 design elements.</td>
</tr>
<tr>
<td>2. Choose 3 pieces of color tissue that fit the color scheme.</td>
</tr>
<tr>
<td>3. Hold 3 tissue pieces together and cut one large shape of the chosen design.</td>
</tr>
<tr>
<td>4. Cut smaller shapes of the chosen design from tissue scraps.</td>
</tr>
<tr>
<td>5. Cover one side of the clear 3 x 5.5&quot; strip with a glue stick.</td>
</tr>
<tr>
<td>6. Attach tissue shapes one at a time.</td>
</tr>
<tr>
<td>7. Cut and add more shapes if needed.</td>
</tr>
<tr>
<td>8. Add a 3 x 5.5&quot; tracing paper strip to the gluey side of the transparency sheet to seal in the shapes.</td>
</tr>
<tr>
<td>9. Flip over and use Sharpies to draw lines and shapes in the chosen colors and line/shape types.</td>
</tr>
<tr>
<td>10. Observe the strip in the kaleidoscope.</td>
</tr>
<tr>
<td>11. Continue with the 2nd, 3rd and 4th art strips, following the design prompt choices.</td>
</tr>
<tr>
<td>12. Use clear tape to attach the slides together to make a long strip.</td>
</tr>
<tr>
<td>13. Observe the final strip in the kaleidoscope.</td>
</tr>
</tbody>
</table>

★★ Facilitate CREATE and Support BEING COURAGEOUS

Help campers stay on task; after about 15 minutes campers should have two slides completed
Make sure campers aren’t getting too caught up in creating super detailed and elaborate collages
Remind campers to stay loose and experimental; they have four chances to try something new
Remind campers that following their design prompts will help them get out of their comfort zones and make new discoveries
Recognize courageous campers; be specific about how they are being courageous
   • Ex: Wow, your strip looks different in all these places, I can tell you are really experimenting as you go – awesome!
### Clean Up (5 min)

| Clean Up                  | Discard scraps of tissue  
|                          | Make sure all caps are on glue sticks and markers  
|                          | All materials can be placed neatly in the center of tables  
|                          | Have campers and your TL help sort the Line, Color, and Shape Reference sheets at table groups for the next rotation  
|                          | Have campers place their art strips with their kaleidoscopes  
|                          | Collect 1-2 camper projects to use during the Wrap Up  
|                          | ➤ Have your TL help restock supplies at table groups for the next rotation  

### Lesson Wrap Up (10 min)

| Discuss a few campers’ projects and have the creators share about their experiences | Hold up chosen projects and have the group notice/share  
|                                                                                  | • The kinds of lines, shapes, and colors the artist used  
|                                                                                  | Have the creators share something about their projects; can be  
|                                                                                  | • Something they’re proud of/their favorite parts  
|                                                                                  | • Something that was especially challenging  
|                                                                                  | • Something interesting they discovered while creating it  
|                                                                                  | • Something they did that they thought was especially innovative/creative  
| ★ Have campers share how they were COURAGEOUS and discuss the importance of BEING COURAGEOUS | Recognize what a wide range of interesting designs you saw in the art strips  
|                                                                                  | Have campers give a thumbs-up if they had to practice being courageous to stretch themselves to try out some new things today  
|                                                                                  | Have a few share what things were especially difficult to try, or to let go of  
|                                                                                  | Others can give “me-too” signal if they had similar experience  
|                                                                                  | Help campers see value of being courageous; ask:  
|                                                                                  | • *What other projects or activities do you do where it’s important to be courageous in the choices you make and how you work?*  
| ★ Invite campers to recognize each other for BEING COURAGEOUS | Can recognize teammates they saw being courageous or who helped them be more courageous  
|                                                                                  | Encourage specificity about how person was courageous  
|                                                                                  | You and TL can recognize campers as well  


Get Ready!

Lesson Materials

* (starred) materials appear multiple times in this list

Copies
- poster, Kandinsky, *Yellow-Red-Blue* (1 per classroom)
- copy, color, *Line Reference Sheet* (1 per 2 campers)
- copy, color, *Shape Reference Sheet* (1 per 2 campers)
- copy, color, *Color Reference Sheet* (1 per 2 campers)
- copy, black and white, *Art Strip Design Planning Sheet* (1 per camper)

General/Adhesives/Tools
- glue stick, washable (1 per camper)
- tape, Scotch, 0.75" wide, *for attaching art strips together* (12 inches per camper)
- scissors, medium, 5", pointed, *for cutting colored tissue* (1 per camper)
- pan, pie, aluminum, 9", *for holding cut tissue sheets* (8 per classroom)
- pencil, #2, *for completing Art Strip Design Planning sheet* (1 per camper)
- glue gun, *for unexpected repairs to camper kaleidoscopes* (1 per classroom)
- glue sticks, *for unexpected repairs to camper kaleidoscopes* (1 per classroom)

Required Materials
- transparency, film, copier, 8.5 x 11" (four 3 x 5.5" strips per camper)
- paper, tracing, 9 x 12" (four 3 x 5.5" strips per camper)
- paper, tissue, asst. colors, 12 x 18" (approx. 2 sheets per camper)
- marker, Sharpie, fine pt. asst. colors, set of 12 (1 per 4 campers)

Spotlight Prep

Lucky you! A prep fairy will be doing the following prep for you. You need to be ready to hand off the materials listed below when your prep fairy arrives.

Prep fairies have these materials and directions listed in their prep guide. They are listed here for you as well so you can double-check that your prep fairy understands what to do and has everything s/he needs.

Materials:
- transparency, film, copier, 8.5 x 11"

Directions:
Cut 8.5 x 11" transparency sheets into 3 x 5.5" pieces (called “clear strips” in lesson plan) (4 strips per camper).
- Important to cut these accurately so the art strips slide easily in kaleidoscopes
- Use paper cutter, cutting 2-3 sheets at a time
- Cut in half lengthwise to make 8.5 x 5.5" sheets

| 5.5" | 5.5" |
• Cut half sheets into 3 x 5.5" strips (2.5" extra can be discarded)

Materials:
• paper, tracing, 9 x 12"

Directions:
Cut 9 x 12" tracing paper sheets into 3 x 5.5" pieces (4 strips per camper).
• Important to cut these accurately so the art strips slide easily in kaleidoscopes
• Use paper cutter, cutting 2-3 sheets at a time
• Cut 1" off the end to make 9 x 11" sheets

• Cut in half lengthwise to make 9 x 5.5" sheets

• Turn the 9 x 5.5" sheets horizontally and cut the 9" width into 3" strips

Materials Preparation

Cut colored tissue sheets on the paper cutter to approximately 3 inch squares (2 sheets per camper in a variety of colors).
• No need to cut the colored tissue accurately – campers will be cutting them again into shapes
• Use paper cutter, cut several sheets at a time

Collate 3 reference sheets (line, shape and color) into packets for 2 campers to share during the Guided Activity.

Fill out a sample Art Strip Design Planning sheet to use in your demo.

Sharpen pencils.

Advance Materials Preparation

Begin creating the kaleidoscope mirror stands for Day 3 (details in the Day 3 prep). This prep is intensive and it’s recommended that you begin now.
Setting Up the Space

Set the materials at each table:
• campers’ kaleidoscopes from previous day on tables, or nearby, for testing
• clear strips, cut from transparency sheets, cut to 3 x 5.5” (4 per camper, plus extras)
• tracing paper strips, cut to 3 x 5.5” (4 per camper, plus extras)
• colored tissue, cut to approx. 3” squares, in pie pans (approx. 24 pcs. per camper)
• glue sticks (1 per camper)
• scissors (1 per camper)
• Sharpie markers (assorted colors 2-3 per camper)

Gather materials for the Guided Activity/Demo & Discussion:
• Set of all collage materials set on the tables for demo
• Kandinsky poster
• Packets of reference sheets (one of each) for every 2 campers, ready to distribute
• Art Strip Design Planning sheet; completed sample plus 1 per camper, ready to distribute
• Pencils – 1 per camper, ready to distribute

Morning Of Preparation

 navCtrl  Plug in one glue gun to warm, away from camper work areas. TL can do any necessary repairs in case the frame of the kaleidoscope comes apart during testing.

Notes

Materials Management
Ex: Place kaleidoscopes on desks prior to the rotation. Campers can find their seats by finding their kaleidoscopes.

On the Board

Mindset of the Day
BE COURAGEOUS – I stretch myself to try new things.

Check In With Your TL

➤ Make sure your TLs are clear about their role in helping today’s lesson run smoothly. Specific things your TL can help with today:
• Encourage campers to honor the design choices they made on their Art Strip Design Planning sheets when they are making their 4 strips. Help them stay on task. After 15 minutes, prompt campers that their time is halfway done and they should have 2 of their 4 strips complete.
• Gather reference sheets at clean up time and resort them to packets that have one of each sheet for campers in the next rotation
• At clean up, help reset tables with fresh supplies for next rotation
Day 3: Kaleidoscopes, Part 3 of 5

Kaleidoscopes are toys that are ordinarily only enjoyed by one viewer at a time. Creating a digital kaleidoscope animation allows many people to share a kaleidoscope viewing experience.

Today: Expressive/Emotive Collages for Digital Kaleidoscope Animation
Today campers explore using line, shape and color to communicate emotions in a large-scale collage that will be used in a digital kaleidoscope animation.

What’s Next
Tomorrow (Day 4) campers use their collages from today in larger mirror stands to create digital kaleidoscope animations using iPads and a stop motion animation app. On Day 5, campers will view their kaleidoscope animations and redesign for a “take two” of their work.
Today’s Project: At-A-Glance

Plan how to express an emotion using the Collage Art Planning Sheet and a guided brainstorm

Ideas for expressing Emotion/Mood #1 on the planning sheet

Follow the design plan to create a collage with cut paper shapes

Color and shapes match design plan; space filled with both large and small shapes

Follow the design plan to add lines with Sharpie

Sharpie lines match design plan; lines added to negative space as well as shapes
Test the first collage in the mirror stand and revise as needed.

Testing for expression of emotion and kaleidoscopic effect in mirror stand.

Repeat the steps to create a collage for a 2nd emotion.

Ideas for emotion #2 on planning sheet; collage of emotion #2.

Combine collages into one strip and test in the mirror stand.

Testing for expression of two emotions and kaleidoscopic effect in mirror stand.
Teaching the Lesson: Overview

OUR SECRET SAUCE: THE G.I.A.

PROCESS FOCUS

GENERATE IDEAS: Brainstorm Funnel
Campers participate in three different kinds of brainstorming techniques, moving from big-picture group brainstorming to specific visualizations about how they’ll use line, shape and color to express emotion.

Why? – Using three different brainstorming techniques will help campers consider their use of design elements from different angles and come up with a more comprehensive vision. Without this multifaceted approach, it might be hard for campers to dig deeper into how they are thinking about line, shape, and color. In particular, breaking down the idea generation process into steps that move from broad to specific will help get their ideas flowing in a way they can build off of.

MINDSET FOCUS

BE VISIONARY – I imagine things that don’t exist yet.
Campers focus in on the essences of their selected emotions and envision specific details about ways to communicate those ideas in their art before starting to work.

Why? – It may be hard for campers to think about how to show an emotion with line, shape and color. Without this challenge, campers may just stay more on the surface level with their thinking, since this is probably new to them. Being visionary will not only help them feel connected to their projects as they identify with a specific emotion, but will help guide their design choices and support critical thinking about their work as they get really clear about what they want to create.

Remember to include these special ingredients to transform today’s project into a Galileo, innovation-based lesson. Bam!
Lesson Breakdown & Camper Goals

<table>
<thead>
<tr>
<th>Introduction</th>
<th>5 min</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Guided Activity: Expressive Art Brainstorm and Visualization</strong></td>
<td>15 min</td>
</tr>
<tr>
<td>□ Discuss expressing emotions with abstract art</td>
<td></td>
</tr>
<tr>
<td>□ Brainstorm pairs of opposite emotions and choose two emotions to focus on</td>
<td></td>
</tr>
<tr>
<td>□ Lead campers through a visualization about how one emotion feels</td>
<td></td>
</tr>
<tr>
<td>□ Fill out the Collage Art Planning Sheet for further brainstorming about emotion #1</td>
<td></td>
</tr>
<tr>
<td>□ Lead campers through another visualization about how to use lines, shapes, and color to express emotion #1</td>
<td></td>
</tr>
<tr>
<td><strong>Demo &amp; Discussion: Creating the Collage Demo</strong></td>
<td>10 min</td>
</tr>
<tr>
<td>□ Demo and discuss starting a collage by cutting and gluing shapes</td>
<td></td>
</tr>
<tr>
<td>□ Demo and discuss adding lines to the collage</td>
<td></td>
</tr>
<tr>
<td>□ Demo testing the collage in the mirror stand</td>
<td></td>
</tr>
<tr>
<td>□ Discuss brainstorming and visualizing specific details for emotion #2 on their own</td>
<td></td>
</tr>
<tr>
<td><strong>Independent Work Time: Creating the Collage</strong></td>
<td>25 min</td>
</tr>
<tr>
<td>□ Choose colors and cut shapes according to the design plan for emotion #1</td>
<td></td>
</tr>
<tr>
<td>□ Plan the composition and glue shapes to the background paper</td>
<td></td>
</tr>
<tr>
<td>□ Add lines with Sharpie</td>
<td></td>
</tr>
<tr>
<td>□ Test in the mirror stand and adjust as needed</td>
<td></td>
</tr>
<tr>
<td>□ Independently go through brainstorm/visualization steps for emotion #2</td>
<td></td>
</tr>
<tr>
<td>□ Repeat the collage steps to make a second collage according to the vision for emotion #2</td>
<td></td>
</tr>
<tr>
<td>□ Glue two collages into one long strip</td>
<td></td>
</tr>
<tr>
<td><strong>Clean Up</strong></td>
<td>5 min</td>
</tr>
<tr>
<td><strong>Wrap Up</strong></td>
<td>10 min</td>
</tr>
</tbody>
</table>

**Timing Notes**
Campers are on track so long as they have created two collages, each using different types of lines, shapes and colors to convey two opposite or different emotions.

If campers or groups are behind
- The second collage can be more minimal.

If campers or groups are ahead
- Campers who are ahead should be encouraged to test their collages in the mirror stands and determine if additional elements can be added to strengthen their moods/emotions.
# Teaching the Lesson: Play-by-Play

## Introduction (5 min)

<table>
<thead>
<tr>
<th>Welcome campers and make a quick story connection</th>
<th>Ex: <em>What’s the latest from Lucy and Finn? (They're working with their friends on a new toy for ToyFest, but Mr. Eville is out to steal their supplies.) That’s too bad, but supplies aren't the only things you need to make a great toy. Let’s inspire the makers with our VISIONARY mindset and artistic ideas.</em></th>
</tr>
</thead>
</table>
| Give context for today’s project: Introduce digital kaleidoscopes | Switch from making a “real” kaleidoscope to a “digital” kaleidoscope  
- Show mirror setup to give campers an idea of what they’ll be doing; slide a piece of paper underneath (for 2nd and 3rd rotation you can use the sample collage you made during the Demo)  
- Mirrors will reflect art, moving art will give kaleidoscope effect  
- Tomorrow they’ll animate  
- Show sample animation (in videos app; file is: ART TOYS sample kaleidoscope animation) |
| Build excitement and give an overview of today’s project | Making a digital kaleidoscope allows many people to share a kaleidoscope viewing experience |
| ★ Introduce the Innovator’s Mindset: BE VISIONARY | Today’s activity is to create the artwork we’ll use in the animations tomorrow  
- Will build on yesterday’s explorations using line, shape and color  
- Will explore ways to use those art elements to express emotions or moods in our collages  
- Will create two different collages that express opposite emotions |

## Guided Activity

### Expressive Art Brainstorm and Visualization (15 mins)

| Observe and discuss how line, shape and color can show emotion in abstract art | Artists use lines, shapes and colors to communicate particular feelings or emotions  
Abstract art works well for expressing emotion, because the artwork often doesn’t look like anything in particular and the viewers can make their own connections  
Show poster *Yellow-Red-Blue* by Wassily Kandinsky |
|---|---|
Point out the shift in colors and shapes from left to right
• Left side is yellow, lighter, softer, less crowded and more calm
• Right side shifts to deeper shades of red and blue, shapes are more condensed, feels more hectic

Have campers share out emotions/moods that they associate with each side
• (Ex: calm & sunny vs. dark & stormy)

**Support GENERATING IDEAS and brainstorm a list of opposite emotions/moods**

We’re going to express emotion in our art today, but first we need to generate ideas about all kinds of emotions and moods

Have campers popcorn brainstorm opposite emotions
(Ex: tired/energetic, shy/outgoing, silly/serious)
Generate 10-12 examples
Write ideas on the board

**Have campers each pick a pair of opposite emotions they will express through collage**

Campers will pick the pair of emotions/moods that will inspire the two collages
Important to feel good about their choices because they are about to do a pretty in-depth brainstorm on one of them
Have campers think about which pairs of emotions may have already given them some “visua”
Think about which pairs of emotions feel familiar to them personally
Which pair of emotions will they be able to think a lot about
Have campers give you a thumbs-up when they have selected a pair of emotions/moods

**Support GENERATING IDEAS as you introduce the Brainstorm Funnel: moving from broad ideas to specific ideas**

Will go through a guided brainstorm about one of the emotions/moods
They will do the second one on their own
This is a Brainstorm Funnel; a certain kind of brainstorm that will start off with the big picture and then get more and more specific
The idea is that campers will have lots of opportunities to think about their chosen emotions in different ways
• Will give them more ideas for expressing them through art
• Will help them really experience the emotions

**Introduce the opportunity to practice BEING VISIONARY while moving from broad to specific ideas during the brainstorm**

Being visionary means being able to picture your idea in your mind’s eye before you start working
This brainstorm will require you to do some real thinking to get clear
Call out as an opportunity to choose:

- Not practicing being visionary – not thinking specifically; not really embracing the brainstorm prompts; starting and ending with the same level of clarity around the idea
- Practicing being visionary – truly embracing each prompt/actively participating in the brainstorm; having a clear and specific idea; ending with a much more specific vision than when they started

Encourage looking out for this opportunity and exercising the power of being visionary.

First thing we’ll do is remember what our emotions really feel like

We’ll do this with a visualization to come up with ideas

- Close eyes (or cover eyes with hands or lower head – whatever feels comfortable)
- Choose one of their two emotions/moods

Offer the following prompts, pausing between each to allow campers to visualize:

- Imagine a time you experienced that emotion or mood.
  - Where were you?
  - Who was there with you?
  - What events caused you to feel that emotion?
  - What else was happening at that time?

Challenge campers to relive that emotion or mood in this moment

They may want to think of other, related words that describe how they were feeling

Have campers give a quiet thumbs-up if they can feel it.

Next, they’ll start getting ideas about what kinds of lines, shapes and colors they associate with emotion #1

Next level of being visionary: getting a little more detailed

Distribute the Collage Art Planning Sheets and pencils

Have campers write their pairs of chosen emotions at the top of each section

Similar to yesterday, campers can write or draw out their ideas

The goal is to come up with several ideas so they have a lot to work with

Fill out your own planning sheet to work off of during the following demo.

| ★ Support BEING VISIONARY and GENERATE IDEAS |
| Guide campers through a visualization to remember what emotion #1 feels like |

| ★ Support BEING VISIONARY and GENERATE IDEAS |
| Have campers brainstorm lines, shapes and colors connected to emotion #1 using the planning sheet |
Support BEING VISIONARY and GENERATE IDEAS

Guide campers through a visualization about how they’ll use colors to convey emotion #1

Picking lines, shapes, colors is a good beginning but it’s how we use them that will make all the difference

Vision is not quite clear yet, will now get even more specific

Have campers close/cover their eyes again

Have campers recall the first visualization and how the emotion felt

Ask them to think about the lines, shapes and colors they just chose

Picture the colors in your mind.

• Are they bright or soft?
• Are there many shades of each color or one version of the color?
• What kind of colors “feel” like your mood/emotion?

Support BEING VISIONARY and GENERATE IDEAS

Guide campers through a visualization about how they’ll use shapes to convey emotion #1

Picture the shapes in your mind.

• Think about the size and style of the shapes and their placement.
• Are they close together or spread apart?
• Layered on top of each other?
• Are they all in the same direction, or alternating?
• Are the shapes solid colors, multi-colors, or something else?
• What will make your shapes “feel” like your mood/emotion?

Support BEING VISIONARY and GENERATE IDEAS

Guide campers through a visualization about how they’ll use lines to convey emotion #1

Picture the lines in your mind.

• Are they thick, thin, long, short, repeating or individual?
• Where will they go? Inside the shapes? Outlining the shapes? Both?
• Could you make patterns with your lines?
• Could your shapes be drawn with these kinds of lines?
• What direction should your lines go in to “feel” like your emotion?
• How should your lines look to “feel” like your emotion?

Support BEING VISIONARY and GENERATE IDEAS

Guide campers to do a final visualization of all the elements together

Ask campers to put all the elements together in a mental picture

• Imagine the specific colors, shapes, and lines you want to use.
• Does the image in your mind “feel” like your emotion?

Give a thumbs-up if they have a pretty clear picture in their mind of what they want to create

Support BEING VISIONARY and remind campers they will do this process on their own for emotion #2

Going through these steps on their own is an awesome chance to practice being visionary

It’s up to them to be intentional and get clear and specific about their plans for the second emotion

Remind them that steps are printed on the back of the Collage Art Planning Sheet

Transition to the upcoming Demo & Discussion

You’ll demo how to create today’s collage and then campers can get working
## Demo and Discussion

### Creating the Collage Demo (10 min)

| Discuss starting the collage with cut paper shapes | Use your own planning sheet to demo following your ideas for your emotion #1
Just like yesterday, campers will start with shapes
They will choose 1 full sheet of construction paper for the background and 4-6 quarter sheets for shapes
A variety of sizes will make the collage more interesting; large shapes will fill the space more quickly
- Large shapes should be about the size of your hand
- Medium shapes should be about the size of your fist
- Small shapes can be cut from scraps |
| Demo planning the composition and gluing shapes | Model planning the placement of the shapes
- Large shapes go down first, filling the page
- Medium and small shapes can layer on top
Use glue stick to adhere well
Remind campers to call on their vision to guide where to place the shapes |
| Demo using markers to add line to express emotion #1 | Just like yesterday, they will add lines after they’ve finalized their shapes
Model choosing markers that fit the chosen color scheme and draw lines that fit the chosen type of line
- Lines can be inside the shapes
- Lines can go around the shapes to accent
- More shapes can be drawn with lines
- Patterns can be created with the chosen line types
Remind campers to follow their visions and the lines that they created in their minds’ eyes |
| **Demo testing the collage in a mirror stand** |  
|---|---  
| When campers feel that they’ve come close to a finished collage, they can view it in the mirror stand to get a preview for the effects it makes as a “kaleidoscope” |  
| Show campers where the mirror stands are set up around the room |  
| Demo sliding the artwork under the mirror stand and sliding it from side to side |  
| Visualize what you notice |  
| • Ex. *Hmmm... it looks really interesting when those particular lines (choose a kind of line) are reflected and I really feel the emotion coming through. I think I’ll go back and add a few more of those lines.”* |  

**Discuss repeating the steps to create the second collage and combining both**  
|  
| When campers are finished with the collage for emotion/mood #1, they should move to collage #2 |  
| Remind campers to go through the visualization steps independently for emotion #2 |  
| Repeat the same steps for creating the collage |  
| Will again test the collage in the mirror stand |  
| Just like yesterday, they will glue the two collages into one long strip for the kaleidoscope animation |
★ Ask campers to take on the Mindset Challenge: BE VISIONARY

Remind that as they work it may feel easier to just put random lines and shapes together

Present challenge: *When this happens you have the choice to create things at random or use your powers of being visionary to create a unique and specific way to use line, color and shape to express emotion.*

Have campers put on their visionary goggles if they accept your challenge

---

**Independent Work Time**

**Creating the Collage** *(25 min)*

<table>
<thead>
<tr>
<th>What campers will do: Create two abstract collages that convey two different emotions</th>
<th><strong>CREATE</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Choose one 9 x 12” piece of construction paper for the background of collage/emotion #1.</td>
<td></td>
</tr>
<tr>
<td>2. Select 4-6 quarter sheets for making shapes that match the color plan.</td>
<td></td>
</tr>
<tr>
<td>3. Cut large, medium and small shapes following the design plan for emotion #1.</td>
<td></td>
</tr>
<tr>
<td>4. Arrange and glue cut shapes on the background.</td>
<td></td>
</tr>
<tr>
<td>5. Add lines with markers following the design plan.</td>
<td></td>
</tr>
<tr>
<td>6. Test the strip in the mirror stand and add to it if needed.</td>
<td></td>
</tr>
<tr>
<td>7. Follow the design planning sheet and visualization steps to get clear on a plan for emotion #2.</td>
<td></td>
</tr>
<tr>
<td>8. Repeat steps 1-6 to create the collage for emotion #2.</td>
<td></td>
</tr>
<tr>
<td>9. Glue the two emotion collages into one long strip.</td>
<td></td>
</tr>
<tr>
<td>10. Test the combined strip in the mirror stand and make changes as needed.</td>
<td></td>
</tr>
</tbody>
</table>

★ Facilitate CREATE and support BEING VISIONARY

Support campers in finding the colored paper that they need

Encourage campers to start with the larger shapes to ensure that they fill the space

Make sure campers are referencing their design planning sheets and recalling their visualizations

Help facilitate efficient sharing of the mirror stands if there seems to be a backup

As you see campers moving on to the second emotion/collage, make sure they are going through the steps of filling out the design planning sheet, and spending independent reflection/visualization time to get clear on their visions

Ask guiding questions that support being visionary:

- *How can you focus in on what that emotion really feels like?*
- *What part about your collage is feeling the most like your emotion? Why?*
- *Tell me about the line, color and shape choices you made.*
- *How can you make your emotion or mood come across stronger?*
Recognize visionary campers; be specific about how they are being visionary
- Ex: I see you are referencing your design planning sheet and even trying out new ideas as you work. Way to follow through on your vision while continuing to get clear about how you want to convey emotion.

### Clean Up (5 min)

<table>
<thead>
<tr>
<th>Clean Up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have campers put all unusable scraps in the recycling bin</td>
</tr>
<tr>
<td>All other materials can be neatly organized in the center of the table groups</td>
</tr>
<tr>
<td>Make sure names are on all camper projects</td>
</tr>
<tr>
<td>Collect one or two camper projects to show during the Wrap Up</td>
</tr>
</tbody>
</table>

### Lesson Wrap Up (10 min)

| Discuss a few campers' projects and have the creators share about their experiences |
| Hold up chosen projects and have the group notice/share |
| - The different shapes, colors, lines the artist used |
| - Have campers guess what emotion they think the artist wanted to express |
| Have the creators share something about their projects; can be |
| - Something they’re proud of/their favorite parts |
| - Something that was especially challenging |
| - Something interesting they discovered while creating it |
| - Something they did that they thought was especially innovative/creative |

★ Have campers share how they were VISIONARY and discuss the importance of BEING VISIONARY

- Recognize the visionary combinations and uses of line, shape and color to create unique expressions of emotion you saw today
- Have campers give a thumbs-up if they had to practice being visionary to get clear on their ideas
- Have a few share what things helped them get really clear on their visions and how their visions impacted how their collages looked
- Others can give “me-too” signal if they had similar experience
- Help camper see value of being visionary; ask:
  - How did being visionary make your abstract collage better?
  - Why do you think being able to be visionary is important for innovators?
  - What other projects or activities do you do where it’s important to be visionary?

★ Invite campers to recognize each other for BEING VISIONARY

- Can recognize teammates they saw being visionary or who helped them be more visionary
- Encourage specificity about how that person was visionary
- You and TL can recognize campers as well
Get Ready!

Lesson Materials

* (starred) materials appear multiple times in this list

**Copies**
- poster, Yellow-Blue-Red, Wassily Kandinsky (1 per classroom)
- copy, black and white, Collage Art Planning Sheet (1 per camper)

**General/Adhesives/Tools**
- glue stick, washable, for creating collage (1 per camper)
- scissors, medium, 5", pointed, for creating collage (1 per camper)
- tray, lunch, for holding supplies (1 per 4 campers)
- pencil, #2 (1 per camper)
- tape, blue, 1" wide, for building mirror stands (18" per stand)
- glue gun, mini, low temp, for building mirror stands (1 per classroom)
- glue stick, melt, mini, for building mirror stands (0.5 per stand)
- marker, washable, assorted colors, set of 8, for creating collage (1 per 4 campers)

**Required Materials**
- iPad, for showing sample video during Introduction (1 per LI)

**Collage**
- paper, construction, brights, asst. colors, 9 x 12" (one 9 x 12" and 4-6 quarter sheets per camper)

**Kaleidoscope mirror stands**
- self-portrait mirror (2 per stand)
- binder clip, sm., for mirror stand construction (4 per stand)
- cube, wood, 0.5", for mirror stand base (4 per stand)
- brace, corner, plastic, for connecting two mirrors at a right angle (1 per stand)

Materials Preparation

Cut construction paper into quarter sheets to make 4.5 x 6" sheets, for collages (4 per camper). Use a paper cutter to cut 6-8 sheets at a time.

Create the kaleidoscope mirror stands (1 per 4 campers).

Build one mirror to ensure you've built it correctly, and then you can build the rest assembly-line style.
- Each stand needs two “self-portrait” mirrors
- Sit the mirrors horizontally on their sides, with the bases facing away from you. The mirrors will come together to form a “V”.

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• Add a 1" piece of blue tape to the top of each mirror’s bent corner. You will glue a brace to the blue tape instead of the mirror itself.

• Hot glue a plastic corner brace to top edge of one mirror on top of the blue tape. Place it as close to corner as possible. Hold for 10 seconds for good adhesion.

• Add hot glue to the other side of the brace and attach it to the other mirror to form a right angle.
• This brace will be the top of the mirror stand.
• Seal the connection between the two mirrors in the back with 1-2 strips of blue tape.

• Now, flip the mirrors upside down in order to add the legs.

• Add one small binder clip to the far corner of all four of the edges. Place the clip half off the edge and fold the “arms” flat. Half of the wire loop will rest off the mirror.
• Hot glue one wooden cube to the flat surface of each clip at the OUTSIDE EDGE. This creates the legs.

• Flip the mirror stand over so it stands on its wooden cube “legs.”

• Test to make sure that two 9 x 12” pieces of construction paper (taped together at the short edges) can slide through the stand horizontally. If the paper gets stuck, slide the binder clips even further off the edge.
Setting Up the Space

Set up a materials station where campers can choose their 9 x 12" and 4.5 x 6" construction paper.

Set the other collage materials at each table group:
- glue sticks (1 per camper)
- scissors (1 per camper)

Set up mirror stands throughout the room where it will be easy for campers to access them and test their collages (1 per 4 campers).

Gather materials for the Guided Activity and Demo & Discussion:
- Kandinsky poster
- one iPad to show sample kaleidoscope animation
- mirror stand
- Collage Art Planning Sheet (1 per camper, plus 1 for yourself)
- pencils (1 per camper, plus 1 for yourself)
- paper, glue, scissors for collage demo

Morning Of Preparation

Plug in one hot glue gun for any emergency repairs to the mirror stands.

Notes

Suggestions for Large Classes
Consider the space/flow of your classroom and set testing stations in areas where campers can access them easily without crowding.

On the Board

Mindset of the Day
BE VISIONARY – I imagine things that don’t exist yet.
Check In With Your TL

➤ Make sure your TLs are clear about their role in helping today’s lesson run smoothly. Specific things your TL can help with today:

• Distribute Collage Art Planning Sheets and pencils during the Guided Activity
Kaleidoscopes are toys that are ordinarily only enjoyed by one viewer at a time. Creating a digital kaleidoscope animation allows many people to share a kaleidoscope viewing experience.

**Today: Digital Kaleidoscope Animation**
Today campers use their collages from Day 3 in large mirror stands to create digital kaleidoscope animations using iPads and a stop motion animation app.

![Image of iPads and kaleidoscope]

**What’s Next**
Tomorrow (Day 5) campers will view their kaleidoscope animations from today and redesign for a “take two” of their work.
Today’s Project: At-A-Glance

Place collage art in a mirror stand in front of an iPad.

Launch the Stop Motion Studio app on the iPad and open a new file.

Button to create a new file.

Work in pairs to move art in small increments and snap a photo at each move.

In pairs, campers work as a team to create stop motion animation.
Switch roles in 5 minute increments

LI manages 5 minute “shifts” for each camper to have a turn animating

Save the file of their “duet” animation

Naming convention includes team color and campers’ first names

Create thaumatropes before or after animating

Example of a thaumatrope created with a printed example
Teaching the Lesson: Overview

OUR SECRET SAUCE: THE G.I.A.

KNOWLEDGE FOCUS

CONCEPTS AND FACTS: Stop Motion Animation
Campers learn that stop motion animation is created by combining many images that capture incremental movements in the subject.

Why? – It’s important for campers to understand the basics of how stop motion animation works so that they understand why they need to take so many photographs with minute changes.

MINDSET FOCUS

BE COLLABORATIVE – I use my strengths to support the work of others.
Campers commit to staying present and focused while working as pairs in both the Art Mover and Director roles to support creating successful stop motion animations.

Why? – Campers truly need their partners in order to create their animations; it’s too time-consuming and difficult to move and photograph their own artwork. It’s possible that campers may want to “check out” when their artwork is not being filmed, as it may feel tedious to be the Art Mover, but recognizing the importance of this role is crucial for camper motivation and collaboration. This challenge supports campers in doing their best in both roles, and understanding that the effort they put in is likely to be reciprocated by their partners.

Remember to include these special ingredients to transform today’s project into a Galileo, innovation-based lesson. Bam!
Lesson Breakdown & Camper Goals

<table>
<thead>
<tr>
<th>Introduction</th>
<th>5 min</th>
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<tbody>
<tr>
<td>Demo &amp; Discussion: How Animation Works and Stop Motion Demo</td>
<td>20 min</td>
</tr>
<tr>
<td>□ Discuss animation and stop motion animation</td>
<td></td>
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<tr>
<td>□ Demo using the animation app to take pictures and create the film</td>
<td></td>
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<tr>
<td>□ Demo working in pairs to take pictures</td>
<td></td>
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<tr>
<td>□ Introduce and demo thaumatropes</td>
<td></td>
</tr>
<tr>
<td>□ Put campers in pairs and split the class into two groups</td>
<td></td>
</tr>
<tr>
<td>Independent Work Time: Digital Kaleidoscope Animation</td>
<td>30 min</td>
</tr>
<tr>
<td>□ Work in pairs to animate kaleidoscope art in 5 minute shifts</td>
<td></td>
</tr>
<tr>
<td>□ While not animating, explore and create thaumatropes</td>
<td></td>
</tr>
<tr>
<td>Clean Up</td>
<td>5 min</td>
</tr>
<tr>
<td>Wrap Up</td>
<td>10 min</td>
</tr>
</tbody>
</table>

**Timing Notes**
Campers are on track so long as they create an animation.

If campers or groups are behind
- Shorten the animation time to 4 minutes per shift.
Teaching the Lesson: Play-by-Play

Introduction (5 min)

| Give context for today's project: Introduce stop motion animation | Today we’ll turn yesterday’s collage art into digital kaleidoscope animations using a Stop Motion app on iPads!
| Stop motion is an animation technique where an object is physically moved in tiny increments in between individual photographs (like clay figures or Legos)
| When you put all the photographs together, it creates the illusion of movement |
| Build excitement and give an overview of today’s project | Making a “duet” animation; 2 campers will work together on one film
| Will take turns being the photographer and the art mover
| After 5 minutes, jobs will switch so everyone has a turn
| They will be able to access their animations online after camp; letter is going home to their parents with all the information
| When they are not animating, they will create a kind of optical illusion called a thaumatrope |
| ★ Introduce the Innovator’s Mindset: BE COLLABORATIVE | Point to this on your Innovator’s Mindset poster
| Define the Mindset element in the context of today’s lesson
| • Today we’re going to focus on being collaborative and working together to support each other. This means bringing your best attention and best efforts to both roles that are needed to create your animations. You won’t be able to create an animation without each other, so we’re going to practice doing the best we can, knowing that it will be returned once the roles are reversed. |

Demo & Discussion

How Animation Works and Stop Motion Demo (20 min)

| Explain how animation works | Show sample kaleidoscope animation
| Explain how animation works
| • Animations, like movies, are made of thousands of still pictures
| • Human eyes work in a way that tricks us into believing we are seeing a moving picture
| • No picture is actually moving!
| • Actually seeing thousands of still pictures shown fast in a row (at least 12 in a second!) and it looks like motion
| Animation is also made by drawing lots and lots of pictures, each slightly different from the other |
| Introduce using “stop motion” animation to create their digital kaleidoscopes | Today’s kaleidoscope animation will be made with a stop motion animation app on the iPad
| Will move the artwork in very tiny increments and snap a photo after each move |
Goal is 120 images in 5 minutes!
Using the mirrors will make the moving image look like it’s a kaleidoscope

Have campers move to view animation demo
Have campers gather around one animation stand for demo
Make sure you have lots of room, see Setting Up the Space in prep section for details and tips
It’s crucial that everyone can see this demo; will need to make room for everyone
Campers closest to the stand may want to kneel or sit in chairs and a second row of campers can be behind them

Observe and discuss the animation stand setup
Point out the mirrors, iPad, ruler guide, and Sign-In Sheet
  • As they saw yesterday, mirrors reflect artwork
  • The iPad has the camera and animation app
  • iPad and mirrors are set up precisely to create the animation and they shouldn’t be moved
  • The ruler is a guide to help campers keep the artwork straight under the mirrors
Campers should write Team Color and names on the Sign-In Sheet next to the iPad
Slide sample artwork underneath the mirrors to show full setup

Demo launching the Stop Motion app and opening a new file
Remind campers to make room for each other so everyone can see each step
Go slowly with each step to give all campers a chance to view
  • Demo “waking up” iPad by pushing “home screen” button
• Point out Stop Motion Studio app and click icon to launch

• App should automatically open on the “Library” page

• Demo clicking the pink circle with white “+” sign button to start a new animation file
**Demo checking whether the camera is framing the mirror and artwork correctly**

- Explain that the lens should already be set to the right angle and height to capture the image we want.
- Still need to check once the camera screen opens up.
- If things need adjusting, they can call an adult to help them.
- Demo checking to make sure the camera catches the artwork and its mirrored reflection without a lot of empty space.

**Demo how to take photos and point out the frameline counter**

- Point out red shutter button and click to snap photo.
- Call out that you are touching gently, so as not to move the iPad.
- Click 3-4 additional photos (without moving art) to be sure all campers have seen the step.
- Point out how the 5 photos you’ve taken now appear in the frameline at the bottom of the screen.
Show campers that they have been counted by the app

It’s challenging for just one person to manage art moving and snapping photos quickly

Collaboration will make it easier

Will work in pairs to create each camper’s animation as part of a two-camper film

Director/Photographer
  - Person whose collage is currently being animated
  - Will use “director’s voice” (clear and direct but not bossy) with cues to move the art

Art Mover
  - Person who moves the art in tiny increments
  - Listens to director’s cues
  - Even though being the art mover may sound less exciting, it’s super important!

The TL will serve as your “art mover” for the demo

Explain that success with animating today will rely on being collaborative

Each person needs to be willing to do their jobs well and with attention

Call out as an opportunity to choose:
  - Not practicing being collaborative – losing focus; not listening for your cues from the director; being impatient; being bossy
  - Practicing being collaborative – listening carefully as art mover; giving clear directions as director; staying on task; being patient; remaining present

Encourage looking out for this opportunity and exercising their powers of being collaborative

Campers will each get 5 minutes to work as director/photographer with their artwork
  - Goal is to snap at least 120 pictures for each camper
  - The same file will be used for both partners, a “duet”
Will move the artwork in tiny increments as far as you can while keeping it in the frame, and then can move it back in the other direction.

Demo being collaborative while shooting the animation as the director (LI) and art mover (TL)

- Establish who will be the Director and who will be the Art Mover first
- Art mover (TL) stands next to/behind the mirrors (keep hands out of photo!)
- Take a pic
- As director, give TL cue to move the art
- TL moves the art less than ¼ inch using the ruler as a guide to keep artwork straight
- Take a another pic
- Repeat! Establish a quick rhythm and take at least 30 images

Have campers share what they notice about how you are working collaboratively

- Ex: You are both focused, leading and following, communicating clearly, working and responding quickly, etc.

Discuss keeping time and switching roles

When campers are working, you will manage the time with a stopwatch

- At “Switch time!” campers will switch roles
- Shift quickly to not lose too much animation time!

They will not start a new animation for the second partner, they will keep adding onto the first one

Demo previewing the animation by clicking the triangular “play” button

Point out the “play” button, just above the shutter button
Push play to give campers a preview of the photos snapped (repeat for all to see, if needed)

Point out how many pictures you’ve taken in your demo, and how long the movie is (it’s going to be very short)

Point out how the animation looks like it’s moving and changing like a kaleidoscope

Again remind campers that for a longer animation with great movement (like the sample), they are going to work quickly to take as many photos as they can in 5 minutes (goal of 120)

**Demo renaming files to save to the Stop Motion app “library”**

Once both campers have shot their animations (in the same file), they will need to save and rename

They can take a short moment to preview the animation first

To save:

- Click the back arrow on the left, just below the camera image

- A new window will open with a single image of their animation and the words “My Stop Motion Movie”
- Click on the words, keyboard will launch
- Demo erasing the existing name and replacign with the naming convention:
  - “Team Color Name + both campers’ first names”
Discuss splitting the class into two groups; animation and thaumatropes

Because there are not enough iPads for everyone to be working at once, the class will be split into two groups.

One group will animate and the other group will work on making thaumatropes, which you will explain in a minute.

Then groups will switch.

It’s crucial that both groups get the full amount of time to animate, so it’s extra important that everyone agrees to follow instructions, move quickly and work efficiently in order to support each other.

Briefly introduce thaumatropes

Thaumatropes were a favorite children’s toy 150 years ago, before movies or animation were invented.

They are made up of two different pictures that “blend” together when spun to look like one image.

Show a sample of an assembled thaumatrope, and spin between hands to make it move quickly.

Point out that a key to making the image blend together is having the two pictures aligned on either side.

It’s super important that campers remember this step!

• This will let you (the LI) know that you should keep this file
• This will allow campers to find their files online after camp
Quickly demo making a thaumatrope

Campers can play around with 2 of the preprinted thaumatropes and then experiment with making 2 of their own

Quickly explain how to make the preprinted thaumatrope

• Cut out two circles
• Tape a skewer to the back of one (make sure it’s right-side up)
• Add glue stick to the back of the other circle
• Sandwich circles together

Can also add to the preprinted thaumatropes

Quickly explain how to make their own thaumatropes (demo only if you are good on time)

Cut out the circles first

The key is to think about the layout of the objects on both circles

One trick is to draw the first image on one circle, and then lay the second circle on top so they can see exactly where to draw the second image
Pair up campers and divide groups in two

This way they will be sure that the two images overlap correctly and are the right size.

An easy self-made thaumatrope is to write half of the letters of your name on each side.

Work with your TL to pair up campers considering who will work well together.

Divide the class into two groups; may be useful to write partners and their group numbers on the board.

If you have an odd number of campers, some campers may just have to be in the art mover role twice to make sure everyone’s work gets filmed.

You only need two campers working at an iPad at once, so you can avoid groups of three.

Simply ask a camper to stay on as part of the second group to be an art mover for someone who doesn’t have a partner.

The thaumatrope group will work on the floor.
★ Ask campers to take on the Mindset Challenge: BE COLLABORATIVE

Remind campers that as they work they may be impatient and excited to film their own projects
- May not feel motivated to be the support person
- May want to spend more time animating on their own pieces

Present challenge: *When this happens you have the choice to think only about yourself and your project or use your power of collaboration to recognize that you and your partner need each other to end up with a successful film.*

Have campers give each other collaborative high fives if they accept your challenge
➤ Have your TL help you distribute artwork to Group 1 campers

Independent Work Time

**Digital Kaleidoscope Animation (30 min)**

<table>
<thead>
<tr>
<th>What campers will do: Work in pairs to create animations; create thaumatropes</th>
<th>CREATE (Animation – Group 1; 10 minutes plus transition)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>1. Add names and team color to the Sign-In Sheet at an animation station.</td>
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<td></td>
<td>2. Establish roles as Partner A and B to determine who will animate first.</td>
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<td></td>
<td>3. Partner A (Director) slides his/her artwork under the animation stand.</td>
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<td></td>
<td>4. Launch the Stop Motion app and open a new animation file.</td>
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<td></td>
<td>5. Confirm the artwork is framed properly in the camera.</td>
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<td></td>
<td>6. Work together to position the art at a good starting point.</td>
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<td></td>
<td>7. Start taking pictures, instructing the Art Mover to move the artwork approximately ¼” at regular intervals.</td>
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<td></td>
<td>8. Continue snapping pictures, shooting to complete at least 120 in five minutes.</td>
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<td></td>
<td>9. Work until the LI announces “Switch!”</td>
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<td></td>
<td>10. Switch roles, inserting Partner B’s artwork under the stand.</td>
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<tr>
<td></td>
<td>11. Repeat steps 1-10 to animate Partner B’s work.</td>
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<tr>
<td></td>
<td>12. When time is up, save their file with their Team Color and names.</td>
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<td></td>
<td>13. Move to the thaumatrope area.</td>
</tr>
<tr>
<td></td>
<td>CREATE (Thaumatropes – Group 2; 10 minutes plus transition)</td>
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<tr>
<td></td>
<td>14. While Group 1 animates, cut and assemble preprinted thaumatropes.</td>
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<td>15. Experiment with creating new thaumatropes using the blank circles.</td>
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<td></td>
<td>16. Use markers to add color to new and preprinted thaumatropes.</td>
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<tr>
<td></td>
<td>17. When time is up, move with a partner to an animation station.</td>
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<tr>
<td></td>
<td>CREATE (if time after both groups have animated)</td>
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<tr>
<td></td>
<td>18. Finish making thaumatropes.</td>
</tr>
</tbody>
</table>
Facilitate CREATE (Animation – Group 1)

Facilitate campers getting set up quickly
Make sure campers are writing their names and Team Color on the Sign-In Sheet
Repeat the first couple steps for opening the app and checking the positioning of the artwork if needed
Try your best to wait to start timing until all pairs are actually ready to go, so that everyone gets the full 5 minutes
If one or two pairs are taking extra long or experiencing difficulties, start the clock for everyone else and you and the TL can assist them individually
Remind campers that they should move the artwork back the other way once they’ve pushed it all the way in one direction
Alert campers at 1 minute intervals
Make sure everyone has a hard stop at 5 minutes
Facilitate smooth transition of artwork and role switching
Remind campers about how to save their artwork and assist where needed

Facilitate CREATE (Thaumatropes – Group 2)

➤ Important: Your TL will mostly be monitoring this group, make sure s/he understands the activity and his/her role
Campers can make more than 2 of their own thaumatropes using scrap paper or copy paper
  • However, you have only been supplied 4 skewers per camper
  • They can use blue tape instead of glue in order to use the same skewer for multiple thaumatropes
If campers finish early, they can try out each other’s thaumatropes or challenge each other to try out more complicated images
➤ If s/he can, the TL can start passing out artwork to Group 2 campers for a quicker transition between groups
Make sure campers write their names on their thaumatropes and set them aside when they move to the animation stations
Have campers clean up the space in the last 2 minutes of Group 1 animation time, before they move to the animation stations

★ Support BEING COLLABORATIVE

Remind campers that they are creating a combined film; it is in their best interests to do a great job with each person’s artwork
Remind campers that both roles are super important for a successful animation
Recognize collaborative campers; be specific about how they are being collaborative
Ask guiding questions that support being collaborative:
  • What things are you and your partner doing well?
  • What things could you and your partner be doing better?
  • If you had a chance to shoot again, how would you work together differently?
  • How are you guys helping each other end up with an awesome animation?
## Clean Up (5 min)

<table>
<thead>
<tr>
<th>Clean Up</th>
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</thead>
<tbody>
<tr>
<td>Clean up scraps and supplies off the floor from the thaumatropes area</td>
<td>Make sure all campers in Group 2 have renamed and saved their artwork</td>
</tr>
<tr>
<td>Make sure all campers have written their names on the Sign-In Sheet at the animation station they were using</td>
<td>Grab one of the iPads to show the animation during the Wrap Up</td>
</tr>
</tbody>
</table>
| ➤ Have your TL check the iPads to make sure there are two videos saved correctly on each |}

## Lesson Wrap Up (10 min)

<table>
<thead>
<tr>
<th>Discuss a few campers’ projects and have the creators share about their experiences</th>
<th>Play the animations on one iPad</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have the creators share something about their projects; can be</td>
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<tr>
<td>• Something they’re proud of/their favorite parts</td>
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<tr>
<td>• Something that was especially challenging</td>
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<tr>
<td>• Something interesting they discovered while creating it</td>
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<tr>
<td>• Something they did that they thought was especially innovative/creative</td>
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</tbody>
</table>

| ⭐ Summarize the importance of BEING COLLABORATIVE and have campers recall if/how they practiced this today | Recognize the group for their collaborative efforts in creating their group animations today |
|                                                                                                          | Highlight effect of practicing Mindset during today’s project |
|                                                                                                          | • Ex: Working collaboratively allowed us to create amazing “duet” animations! We accomplished an incredible amount of work, shooting hundreds of animation shots thanks to everyone using their strengths to support each other’s work! |
|                                                                                                          | Have campers give their partners a high five if they practiced being collaborative today by: |
|                                                                                                          | • Being patient, clear and focused as the Director |
|                                                                                                          | • Staying present, listening to the Director, and working carefully as the Art Mover |
|                                                                                                          | If applicable recognize specific campers for exhibiting above behavior |
|                                                                                                          | Review why collaboration is important for innovation |
|                                                                                                          | • Ex: When we work together, bringing our strengths to support each other, we are able to accomplish challenging tasks and create great things together! |

| ⭐ Have campers share how they were COLLABORATIVE and discuss the importance of BEING COLLABORATIVE | Have a few campers share ways in which they were collaborative |
|                                                                                                          | Others can give “me-too” signal if they had similar experience |
|                                                                                                          | Help campers see value of being collaborative; ask: |
|                                                                                                          | • How did being collaborative make your animation better? |
|                                                                                                          | • Why do you think being able to collaborative is important for innovators? |
|                                                                                                          | • What other projects or activities do you do where it’s important to be collaborative? |
★ Invite campers to recognize each other for BEING COLLABORATIVE

- Can recognize teammates they saw being collaborative or who helped them be more collaborative
- Encourage specificity about how person was collaborative
- You and TL can recognize campers as well
Get Ready!

Lesson Materials

* (stared) materials appear multiple times in this list

Copies
- copy, black and white, iPad/Animator Sign-In Sheet (1 per 4 campers)
- copy, black and white, Thaumatropes, 3-sheet packet (1 per camper)

General/Adhesives/Tools
- tape, blue, 1" wide, for iPad stand (12" per iPad)
- tape, masking, 1", for attaching skewer to thaumatrope (6" per camper)
- scissors, medium, 5", pointed, for cutting out thaumatropes (1 per 2 campers)
- pencil, #2, for drawing thaumatrope images (1 per camper)
- eraser, vinyl, white, for thaumatropes (1 per 2 campers)
- marker, washable, asst. color, set of 8, for coloring thaumatrope images (1 per 4 campers)
- glue stick, washable, for assembling thaumatropes (1 per 2 campers)
- ruler, plastic, used as a guide at animation station (1 per 4 campers)

Required Materials

Animation
- mirror stand, assembled, from Day 3 (1 per 4 campers)
- camper collage art from Day 3 (1 per camper)
- iPad 2, wifi only, 9.7", 16 GB, Apple (1 per 4 campers, 1 per LI)
- case, iPad, silicone (1 per iPad)
- stand, iPad, adjustable, acrylic, 4.5" h x 3.75" w x 5.5" d (1 per iPad)
- box, pizza, 12 x 12 x 2", for animation stand (1 per iPad)
- stopwatch, for timing 5 minute animation sessions (1 per classroom)

Thaumatropes
- skewer, wood, 10 inch, for spinning thaumatropes (4 per camper)

Materials Preparation

Create animation stations with the mirrors and iPads (1 per 4 campers).
- Decide how and where you want to set up the animation stands at desks or table groups.
- Make sure there is enough room for 2 campers (partners) to be working at one animation station.
- You will not leave the iPads at the animation stations overnight. Set them up to ensure the right distance/angle and then replace them in the morning.

Set the mirror stands at the back edge of the desk or table.

Tape the back legs in place with blue tape.
Align a ruler with the outer edge of the mirror to make a “track” for the artwork to slide smoothly under the mirrors. Tape it in place with blue tape.

Slide a camper’s collage under the stand to test the alignment.

Place the adjustable stand (easel) near the edge of the 12 x 12” pizza box. Lay two pieces of blue tape (roughly 6” each) horizontally across the “legs” of the stand to keep it secure on the box.
Place the iPad horizontally in the stand with the camera ON THE LEFT.

Place a piece of art under the mirror stand, open the Stop Motion app, and adjust the box and angle of the iPad so that it captures the artwork and the mirrored reflection.
When you’ve found the appropriate distance and angle, secure the pizza box to the table with blue tape.

<table>
<thead>
<tr>
<th>Set up a system for tracking which campers are using which iPads:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Number all the iPads</td>
</tr>
<tr>
<td>• Keep iPads at the same animation stations on Day 4 and Day 5</td>
</tr>
<tr>
<td>• Tape iPad/Animator <strong>Sign-in Sheet</strong> at each Animation Station</td>
</tr>
<tr>
<td>• Fill out the corresponding iPad # on each sheet</td>
</tr>
<tr>
<td>• Ensure campers write their names and Team Color on this sheet when they are working</td>
</tr>
<tr>
<td>• This will help you track if there are any technical problems</td>
</tr>
</tbody>
</table>

Write iPad numbers and campers’ Team Color and names on the board as well. This will help you, your TLs, and campers remain organized and accountable.

<table>
<thead>
<tr>
<th>Prep a sample thaumatrope to use during the Demo &amp; Discussion using one of the printed examples in the <strong>Thaumatrope</strong> copy.</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Cut out both circles</td>
</tr>
<tr>
<td>• Tape a skewer to the back of one circle</td>
</tr>
<tr>
<td>• Add glue stick to the back of the other circle</td>
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<tr>
<td>• Sandwich them together</td>
</tr>
</tbody>
</table>

Sharpen pencils if needed.

Make sure the iPads are ready to go.

| • Ensure all iPads are in the proper cases |
| • Charge them overnight                  |
| • Check the Stop Motion app and make sure it’s functioning properly |

*If this is the second time you are teaching this theme: Have a TL or SI help you delete all the camper videos from the first theme.*

**IMPORTANT:** You must upload all camper videos from Day 4 at the end of the day on Day 4, or campers will not have access to their work after camp. See upload instructions on page. You will upload Day 5 videos after camp on Friday.
Setting Up the Space
You should have already set up your animation stations. Be sure you have chosen 1 station that is easily accessible for the Demo & Discussion, or create an “LI” animation station on a desk/table at the front of the classroom.

Be sure campers’ collage art is organized by team for easy distribution during the rotation.

The thaumatrope work area will be on the floor. Make sure you have adequate space.

Gather thaumatrope materials for easy distribution:
- Thaumatrope sheet copies (3-sheet packet – 1 per camper)
- scissors (1 per 2 campers)
- glue sticks (1 per 2 campers)
- pencils (1 per camper)
- erasers (1 per 2 campers)
- markers, assorted (1 per 4 campers)
- masking tape (6” per camper, you can just put a few rolls out)
- skewers (4 per camper)

Gather materials for the Demo & Discussion:
- Sample thaumatrope and set of thaumatrope materials for demo
- Animation stand ready for campers to watch demo (see above)

Morning Of Preparation

Set up iPads in stands at Animation Stations and open the Stop Motion app to double-check positioning.

Notes

Materials Management
Campers who were absent on Day 3 can work on their own to make two abstract collages today that they will film tomorrow.

Suggestions for Large Classes
For double-TL rotations, up to eight animation stands may need to be set up. Take extra time to plan out maximum use of space so campers will have room to work.

On the Board

Mindset of the Day
BE REFLECTIVE – I use my strengths to support the work of others.

Write a reminder for how campers should save their work:
“Team Color Name + Both Campers’ Names”
Ex: Silver Eli Brandon
Check In With Your TL

➤ Make sure your TLs are clear about their role in helping today’s lesson run smoothly. Specific things your TL can help with today:

- TL serves as Art Mover during demo
- Manage thaumatropes creation section while you manage animation stations; be sure to brief TLs about facilitation notes in the curriculum
- If time during clean up, your TL can assist in confirming files have been named properly on the iPads
Kaleidoscopes are toys that are ordinarily only enjoyed by one viewer at a time. Creating a digital kaleidoscope animation allows many people to share a kaleidoscope viewing experience.

**Today: Digital Kaleidoscope Animation**
Today campers view their kaleidoscope animations from Day 4 and explore techniques to alter and improve their animations in a “take two” redesign of their work.
Today’s Project: At-A-Glance

View sample videos for two redesign techniques

Files saved in Videos app

Watch their own Day 4 videos and consider redesign choices

Day 4 animations are in the Stop Motion Studio Library

Alter their collages by cutting them up and reassembling

Collages cut into strips and taped back together
Add more designs with markers

Adding more details and designs that fit the theme with marker

Reshoot the animation with the same partner; change the motion if desired

Artwork moving left and right during animating

Create thaumatrope or decorate kaleidoscope when done animating

Playing with a finished thaumatrope; outside of kaleidoscope decorated with variety of materials
Teaching the Lesson: Overview

OUR SECRET SAUCE: THE G.I.A.

PROCESS FOCUS

REDESIGN
Campers rewatch their own videos from Day 4 and decide how they will cut, rearrange and add details to end up with a totally different second animation.

Why? – This lesson asks that campers make a big redesign to their work, but as this entire process is probably very new for them, it’s possible that they might not know where to start. It’s important to show campers what a kaleidoscope redesign might look like and how to get there before we can ask them to commit to being experimental. After they have this base understanding, giving them specific things to evaluate about their work will help them make decisions about what to do.

MINDSET FOCUS

BE COURAGEOUS – I stretch myself to try new things.
Campers embrace experimentation and try redesigning their artwork in ways that might feel risky or unfamiliar.

Why? – Even though they have made fairly simple abstract collages, campers may feel resistance to taking apart their artwork and changing it up so much. However, making these kinds of big changes is what’s going to lead them to a totally different second animation. It’s likely campers would not make as bold a choice on their own. Pushing past their uncertainty and leaning into making all kinds of new changes will give them a lot more to work with and a much different second animation.

Remember to include these special ingredients to transform today’s project into a Galileo, innovation-based lesson. Bam!
Lesson Breakdown & Camper Goals

<table>
<thead>
<tr>
<th>Activity</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Introduction</strong></td>
<td>5 min</td>
</tr>
<tr>
<td><strong>Guided Activity: Redesign Planning</strong></td>
<td>15 min</td>
</tr>
<tr>
<td>Discuss redesigning kaleidoscope animations</td>
<td></td>
</tr>
<tr>
<td>Watch before and after kaleidoscope sample vids</td>
<td></td>
</tr>
<tr>
<td>Watch camper vids from Day 4</td>
<td></td>
</tr>
<tr>
<td>Facilitate deciding on a redesign plan with the partners from Day 4</td>
<td></td>
</tr>
<tr>
<td>Review timing for Independent Work Time</td>
<td></td>
</tr>
<tr>
<td><strong>Independent Work Time: Art Alteration andAnimating</strong></td>
<td>40 min</td>
</tr>
<tr>
<td>Work with their partners to alter or add to their kaleidoscope artwork</td>
<td></td>
</tr>
<tr>
<td>After 10 minutes, Group 1 animates their updated artwork</td>
<td></td>
</tr>
<tr>
<td>After 5 minutes, switch with Group 2 to animate their updated artwork</td>
<td></td>
</tr>
<tr>
<td><strong>Clean Up</strong></td>
<td>5 min</td>
</tr>
<tr>
<td><strong>Wrap Up</strong></td>
<td>5 min</td>
</tr>
</tbody>
</table>

**Timing Notes**
Campers are on track so long as they’ve altered their artwork and completed the second animation.

If campers or groups are behind
- Shorten the animation time to 4 minutes per shift.
## Teaching the Lesson: Play-by-Play

### Introduction (5 min)

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Welcome campers and make a quick story connection</td>
<td>Ex: ToyFest is today! That means we’d better finish up the last of this week’s artistic, one-of-a-kind toys and make sure we’re ready to lend our innovative support to Lucy, Finn and the makers.</td>
</tr>
<tr>
<td>Build excitement and give an overview of today’s project</td>
<td>Today is all about redesigning and trying something new in order to experiment! We can call this “Take Two”; term used in film when shooting something again. We’ll have a chance to totally change up our artwork and try out some different things when shooting to end up with a second animation that is much different than the first. Campers will modify their own artwork, but will animate with their partners from yesterday and stay in the same class groups as yesterday.</td>
</tr>
</tbody>
</table>

### ★ Introduce the Innovator’s Mindset: BE COURAGEOUS

Point to this on your Innovator’s Mindset poster

Define the Mindset element in the context of today’s lesson

- Today we’re going to focus on being courageous. This means trying new things even if it feels like a stretch. Today we’re going to completely change the artwork we created yesterday in order to experiment with what kinds of effects we can add to our animations. It might feel like a risk to make such big changes to your work, but trying new things is the best way to get new results!

### Guided Activity

### Redesign Planning (15 min)

<table>
<thead>
<tr>
<th>Activity</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Have campers sit in groups according to which iPad they used yesterday</td>
<td>Take a moment to organize campers so they are sitting with their partners and the other pair of campers who used the same iPad. You or the TL can read off the list of names from the Sign-In Sheet to move things along. Campers will need to be in these groups so that they can rewatch their animations from yesterday as they decide how they want to redesign. Quickly assign a partner/group to campers who were absent on Day 4.</td>
</tr>
<tr>
<td>Support REDESIGN as you discuss redesigning their kaleidoscope animations by altering their artwork</td>
<td>Today campers will have a chance to shoot another animation. They will play around with changing the artwork to create different effects in the film. The main way they will do this is by cutting their art into pieces and putting it back together again!</td>
</tr>
<tr>
<td>★ Introduce the opportunity to BE COURAGEOUS when redesigning their animations</td>
<td>We don’t normally cut up art that we just made and put it back together in a totally new way! This might feel strange and you might feel nervous about not knowing how the artwork and animation will turn out!</td>
</tr>
</tbody>
</table>
Campers may feel some resistance to this at first
  • Assure them that they can easily create other collages just like this one after camp
  • Remind them that the abstract collage was always intended to be for this animation
  • They are redesigning their work in order to explore what else they can do with the animation

Call out as an opportunity to choose:
  • Not practicing being courageous – changing as little as possible about your artwork; letting your uncertainty hold you back from experimenting; feeling like the animation redesign needs to be “perfect”; being unwilling to take any risks
  • Practicing being courageous – embracing the idea of having a chance to experiment; trying out whatever ideas you have; being excited to try something new; knowing that things might not work out as you imagined

Encourage looking out for this opportunity and exercising the power of being courageous

Support REDESIGN

Have campers watch Redesign Video 1: Altering the Artwork

They will watch a few “before” and “after” videos to get a sense of how altering their artwork will look as an animation

Each group of four campers will watch the videos on the iPads they used yesterday

Important to follow instructions carefully

➤ Pass out the iPads
  • Have your TL help
  • Make sure the correct number goes to the correct group

Show campers where to find Redesign Video 1: Altering the Artwork and have them watch the short video
  • Open Video App (on home screen)
  • Click on: ART TOYS Redesign Video 1

Campers can watch twice if needed

Once everyone has watched, have campers put the iPads face down so they are ready for the next steps

Support REDESIGN as you demo and discuss cutting the artwork into strips or quarters

Have campers share what they noticed about how cutting and reassembling the artwork changed the animation
  • (May seem like it’s more complex, more detailed, visual effect is more interesting, etc.)
Two simple ways to get this effect are by cutting each collage into four vertical strips or four quarter sheets.

It’s easier to put collages back together if both are cut in the same way (both strips or both quarters), but campers can try other things if they want.

The most important thing is that the artwork fits back together as two rectangular 9 x 12” pieces (just like the original).

Demo cutting a piece of construction paper into four even strips

- Fold the paper in half and then in half again

- Cut on the lines

(After rotation 1, you can use these pre-cut papers to demo assembling; you don’t have to cut new ones every time)

Demo cutting a piece of construction paper into four even quarters

- Fold in half
- Fold in half the other way
• Cut on the folds

Will have to cut their two collages apart in order to fold them both into quarters

<table>
<thead>
<tr>
<th>Support REDESIGN and discuss reassembling cut collages</th>
</tr>
</thead>
<tbody>
<tr>
<td>The fun part is deciding how to put all the pieces back together</td>
</tr>
<tr>
<td>Lots of options, can play around with arrangements before finalizing anything</td>
</tr>
<tr>
<td>• Alternate collages by strip or quarter</td>
</tr>
<tr>
<td>• Change the orientation of the pieces when putting them back together</td>
</tr>
<tr>
<td>• Put pieces together that fit in some way: similar colors in similar areas, shapes or lines look continuous</td>
</tr>
<tr>
<td>Take camper suggestions for other ways to put the cut collage pieces back together</td>
</tr>
<tr>
<td>Campers will use Scotch tape on the back to assemble</td>
</tr>
<tr>
<td>Remind campers that however they cut or reassemble, everything must go back into the shape of the original artwork (two 9 x 12&quot; pieces) so it fits under the mirror stand</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Support REDESIGN and discuss adding to the artwork with markers</th>
</tr>
</thead>
<tbody>
<tr>
<td>In addition, campers can add even more detail and design to their artwork with markers</td>
</tr>
<tr>
<td>After reassembling their collages, they may see new patterns, shapes or areas that they want to highlight with marker</td>
</tr>
<tr>
<td>Can also simply add more designs</td>
</tr>
<tr>
<td>• Fill in white spaces</td>
</tr>
<tr>
<td>• Add repeating patterns or motifs</td>
</tr>
<tr>
<td>• Fill in shapes with designs</td>
</tr>
</tbody>
</table>
Support REDESIGN as you discuss changing the direction of the artwork as an additional redesign option

While animating, campers can change the direction of the artwork for added redesign options
Can move the artwork back and forth under the mirror more frequently

Support REDESIGN

Have campers watch Redesign Video 2: Changing Directions

Show campers where to find Redesign Video 2: Changing Directions and have them watch the short video
- Open Video App (on home screen)
- Click on: ART TOYS Redesign Video 2

Campers can watch twice if needed
Once everyone has watched, have campers put the iPads face down so they are ready for the next steps
Have campers share their thoughts on this kind of redesign

Support EVALUATE and discuss reviewing their animations as a group of 4 and key points to think about while watching

Campers will watch their animations in the small groups they are in now to evaluate what kinds of redesign they want
This means they will see their own animations as well as another pair’s
Great chance to see how some other animations turned out and get ideas from them
Point out that there will be animations from other rotations saved on the library as well; they will only watch their own
As they watch their films they should notice/think about
- Particular effects they like (Ex: when large shapes are reflected)
- Particular effects they don’t like as much (Ex: when there’s blank space)
- What kind of redesign would make the second animation the most different from the first (Ex: mixing up the colors, adding bolder lines, changing the direction several times)
- Areas where they might want to add more detail or designs

Have campers view their animations from yesterday

Have campers open up the Stop Motion app in their iPads and go the Library
Whichever pair of campers’ names and videos is first, can play that first
Campers can view their animations twice
The animations will be short, so be sure to encourage campers to switch to the second pair of campers within about a minute
Once everyone has watched, have campers put the iPads face-down so they are ready for the next steps
**Support EVALUATE**

**Guide campers to reflect on what they noticed about their animations**

Have campers think about:
- Particular effects they liked
- Particular effects they didn’t like as much
- What kinds of redesign would make the second animation the most different from the first
- Areas where they might want to add more detail or designs

Evaluating particular things about your current artwork is an important first step in the redesign process

If you have time, have 1-2 campers share one of these points

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**★ Support BEING COURAGEOUS and REDESIGN**

**Have campers commit to the individual redesigns they want to do with their animations**

Time to make our plans for redesigning and trying new things

We’ll decide right now what kinds of changes we’re going to make to our artwork and what kinds of things we’ll try during animating

Have campers silently think about:
- How they will try cutting and reassembling their artwork
- Where/if they will add more designs with marker and paper
- What they’ll do differently during animating

Remind campers that today is all about experimenting in order to get new and interesting results in their animations

This requires us to do things we wouldn’t normally do and make decisions even if we don’t know how they’ll turn out

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**Explain the timing for Independent Work Time**

Everyone will work on their artwork here on the floor for 10 minutes

Then, Group 1 will move to the animation stations and shoot their films (10 minutes)

Today they will save their files as “2, Team Color, Names”
- Ex: 2 Teal Jordan Maya

Group 2 will remain on the floor and work on their art, thaumatropes, or their handmade kaleidoscopes

When time is up, groups will switch

Group 2 will move to Animation Stations and shoot their films while Group 1 works on the floor (10 minutes)

There is time built in for everyone moving and switching around
- Still very important to be as efficient and quick as possible during the transition
- Crucial that everyone gets enough time animating

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**Discuss adding to the exterior of their handmade kaleidoscopes when finished with artwork modification**

Once they are done with modifying their artwork they can
- Continue with thaumatropes
- Decorate the exteriors of their handmade kaleidoscopes
- Modify their art strips from Day 2

Show materials available for decorating
- Sequins
- Foam letters
- Jewel stickers
★ Ask campers to take on the Mindset Challenge: BE COURAGEOUS

Remind campers that as they work they may feel unsure about cutting up their artwork and adding things to it

Present challenge: When this happens you have the choice to stop experimenting or use your powers of being courageous to try this new way of working with your art in order to experiment with your animation!

Have campers give you a thumbs-up if they accept your challenge

Independent Work Time

Art Alteration and Animating (40 min)

What campers will do: Alter their collages and animate them with a partner

<table>
<thead>
<tr>
<th>REDESIGN and CREATE (All Campers – 10 minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Cut collage artwork into four strips or quarters.</td>
</tr>
<tr>
<td>2. Test out different reassembly combinations.</td>
</tr>
<tr>
<td>3. Reassemble the collage with Scotch tape.</td>
</tr>
<tr>
<td>4. Add more details with marker if desired.</td>
</tr>
<tr>
<td>5. After 10 minutes, move to animation stations if in Group 1. Continue working on the floor if in Group 2.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CREATE (Animations, Group 1 – 10 minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. Add names and Team Color to the Sign-In Sheet at the animation station.</td>
</tr>
<tr>
<td>7. Establish roles as Partner A and B to determine who will animate first.</td>
</tr>
<tr>
<td>8. Partner A (Director) slides his/her artwork under the animation stand.</td>
</tr>
<tr>
<td>9. Launch the Stop Motion app and open a new animation file.</td>
</tr>
<tr>
<td>10. Confirm the artwork is framed properly in the camera.</td>
</tr>
<tr>
<td>11. Using the same method as Day 4, work together to create an animation by moving and photographing the artwork in tiny increments.</td>
</tr>
<tr>
<td>12. Incorporate changes/modifications to the shooting process as desired.</td>
</tr>
<tr>
<td>13. Work until the LI announces “Switch!”</td>
</tr>
<tr>
<td>14. Switch roles, inserting Partner B’s artwork under the stand.</td>
</tr>
<tr>
<td>15. Repeat the steps to animate Partner B’s work.</td>
</tr>
<tr>
<td>16. When time is up, save the file with the number 2, their Team Color and their names.</td>
</tr>
<tr>
<td>17. Move back to the floor area (see Steps 18-20).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CREATE (Decorations, Group B – 10 minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18. While Group 1 animates, continue working on thaumatropes from Day 4.</td>
</tr>
<tr>
<td>19. Use a variety of materials to add decoration to the outsides of their handmade kaleidoscopes.</td>
</tr>
<tr>
<td>20. When time is up, move with the partner to an animation station.</td>
</tr>
</tbody>
</table>
Facilitate REDESIGN, CREATE and BEING COURAGEOUS (All Campers)

- Have your TL help you pass out camper artwork as quickly as possible so campers can get working
- Pass out scissors, Scotch tape, and markers on trays
- Make sure campers aren’t getting overly complicated with their cutting and reassembly plans
- Encourage campers to try out a variety of arrangements before taping anything together
- If you have scrap paper available, campers can use that to add to their collages as well
- Give campers a 2 minute warning before they’ll need to start cleaning up to transition to the animation station (Group 1 only)
- Recognize courageous campers; be specific about how they are being courageous
  - Ex: Whoa! I barely recognize your collage; you’ve changed it up so much. I know you were really excited about it yesterday. Way to be courageous and try something totally new!
- Ask guiding questions that support redesign and being courageous:
  - Tell me about the new things you’re trying with your artwork redesign.
  - How do you think these changes will make your second animation much different than your first?
  - What do you feel you’re taking a risk on?

Facilitate REDESIGN, CREATE and BEING COURAGEOUS (Animations)

- Facilitate campers getting set up quickly
- Try your best to wait to start timing until all pairs are actually ready to go, so that everyone gets the full 5 minutes
- Alert campers at 1 minute intervals
- Make sure everyone has a hard stop at 5 minutes
- Facilitate smooth transition of artwork and role switching
- Remind campers about how to save their artwork and assist where needed
- Ask guiding questions that support create and being courageous:
  - Tell me about the new things you’re trying with your second animation.
  - How do you think these changes will make your second animation much different than your first?
  - What do you feel you’re taking a risk on?

Facilitate CREATE (Decorations)

- If campers want to keep working on thaumatropes, they can grab the ones they were working on yesterday
- If you’ve set up separate tables for the kaleidoscope decorations, direct campers who are ready to work there
- Make sure campers aren’t going overboard with any of the embellishment materials so you don’t run out
- Campers can also modify or add to their art strips if they want
### Clean Up (5 min)

| Clean Up | Clean up scraps, markers, etc. on the floor  
| Make sure supplies are organized  
| Make sure all campers in Group 2 have renamed and saved their artwork  
| Make sure all campers have written their names on the Sign-In Sheet at the animation station they were using  
| Grab one of the iPads to show the animations during the Wrap Up  
| ➤ Have your TL check the iPads to make sure there are two videos saved correctly on each |

### Lesson Wrap Up (5 min)

| Discuss a few campers’ projects and have the creators share about their experiences | Play the animations on one iPad; make sure they are from today  
| Have campers notice the changes the artists made to their work  
| Have the creators share something about their projects; can be  
| • Something they’re proud of/their favorite parts  
| • Something that was especially challenging  
| • Something interesting they discovered while creating them  
| • Something they did that they thought was especially innovative/creative  
| Let campers know that they can keep creating on their own at home!  
| • Stop Motion App is available  
| • Know how to create their own kaleidoscope artwork  
| • Can try out making stop motion animation with other things  

| ★ Have campers share how they were COURAGEOUS and discuss the importance of BEING COURAGEOUS | Recognize how interesting their second animations turned out!  
| Have campers give you a double thumbs-up if they had to practice being courageous to try something totally new and different with their artwork  
| Have a few share what felt like the biggest stretch or risk for them  
| Others can give “me-too” signal if they had similar experiences  
| Help campers see value of Mindset; ask:  
| • How did being courageous make your second animation better?  
| • Why do you think being able to be courageous is important for innovators?  
| • What other projects or activities do you do where it’s important to be courageous?  

| ★ Invite campers to recognize each other for BEING COURAGEOUS | Can recognize teammates they saw being courageous or who helped them be more courageous  
| Encourage specificity about how person was courageous  
| You and TL can recognize campers as well |
## Get Ready!

### Lesson Materials

* (starred) materials appear multiple times in this list

#### Copies
- copy, black and white, iPad/Animator Sign-In Sheet (1 per 4 campers; from Day 4)
- copy, black and white, Thaumatropes, 3 sheet packet (1 per camper)
- copy, black and white, Letter Home (1 per camper)

#### General/Adhesives/Tools
- scissors, medium, 5”, pointed, for cutting collages (1 per camper)
- pencil, #2, for drawing thaumatrope images (1 per camper)
- eraser, vinyl, white, for thaumatropes (1 per 2 campers)
- glue stick, washable, for assembling thaumatropes (1 per 2 campers)
- tape, Scotch, 0.75” wide, for re-taping altered collage art (12” per camper)
- marker, washable, asst. color, set of 8, for altering collages and decorating kaleidoscopes (1 per 4 campers)
- glue dots, 1/2”, for adhering sequins to kaleidoscope (10 per camper)
- deli container, 16 oz., for holding embellishment materials (3 per 8 campers)
- tray, lunch, for distributing supplies (1 per 4 campers)

#### Required Materials

**Animation (same setup as Day 4)**
- mirror stand, assembled (1 per 4 campers; from Day 3)
- camper collage art from Day 3 (1 per camper)
- iPad 2, wifi only, 9.7”, 16 GB, Apple (1 per 4 campers, 1 per LI)
- case, iPad, silicone (1 per iPad)
- stand, iPad, adjustable, acrylic, 4.5” h x 3.75” w x 5.5” d (1 per iPad)
- box, pizza, 12 x 12 x 2”, for animation stand (1 per iPad)
- stopwatch, for timing 5 minute animation sessions (1 per classroom)

#### Camper Choice Materials

(Campers will choose some of these materials, but not all of them. You have not been supplied with enough choice materials for every camper to use each option. Choice materials are supplied for variety under the assumption that not every camper will choose every material.)

**Thaumatropes**
- skewer, wood, 10 inch, for spinning thaumatropes (4 per camper)

**Decorating kaleidoscopes**
- sequin, asst. colors & sizes (10 per camper)
- foam, alphabet piece, sticky back (6 per camper)
- sticker, jewel (4 per camper)
Materials Preparation

Be sure to send campers with the Letter Home copy which explains how they can access their projects on Dropbox.
- If the Science LI is providing campers with bags to bring their projects home, you may want to consider placing the letter directly in the bags.
- Coordinate with your CD if you’re not sure of the best way to ensure that this copy gets home.

Make sure all iPads are charged.

IMPORTANT: You must upload all camper videos at the end of the day on Day 5, or campers will not have access to their work after camp. See upload instructions on page

Advance Materials Preparation

Preview the Materials Prep for the Week Ahead (at the start of each theme), especially Monday’s prep, which needs to be completed by the end of the day Friday.

Review the essential resources for your upcoming theme in your Telescope Library and complete any tasks prescribed there including highlighting key points in lessons, creating samples, and/or watching videos. If this is your second time teaching the theme make sure to check the curriculum updates section even if you've already looked at the other resources previously.

Setting Up the Space

Keep the animation stations set up from Day 4.

Gather materials for the altering artwork part of Independent Work Time:
- campers’ collage art, sorted by Team Color
- scissors (1 per camper)
- Scotch tape (1 roll per 4 campers)
- markers (1 set per 4 campers)

Set aside materials for thaumatropes and kaleidoscope decorating, to be pulled out when needed:
- pencils (1 per camper)
- erasers (1 per 2 campers)
- glue sticks (1 per 2 campers)
- 10” wood skewers (4 per camper total, shouldn’t take more if they used 4 yesterday)
- Thaumatropes color copies (1 per camper total, shouldn’t take another one if they used one yesterday)
- sequins (10 per camper), in 16 oz. deli container (1 deli container per 8 campers)
- foam alphabet pieces (6 per camper) in deli containers or on a tray (1 tray/deli container per 8 campers)
- jewel stickers (4 per camper) in deli containers (1 deli container per 8 campers)

Gather materials for the Guided Activity:
- iPads (1 per 4 campers, plus 1 for LI)
- two 9 x 12” pieces of construction paper to demo altering a collage
- scissors
- Scotch tape
Notes
Materials Management
Campers who were absent on Day 4 can work with a partner to do their first animations.

On the Board
Mindset of the Day
BE COURAGEOUS – I stretch myself to try new things.

Write a reminder for how campers should save their work:
“2 Team Color Name + Both Campers’ Names”
Ex: 2 Silver Eli Brandon

Check In With Your TL
➢ Make sure your TLs are clear about their role in helping today’s lesson run smoothly. Specific things your TL can help with today:
  • Help group campers according to the iPads they used
  • Help facilitate campers working on their thaumatropes and decorating their kaleidoscopes
  • Facilitate transitions between Groups for animating
  • Check the iPads at the end of class to make sure there are two videos saved correctly on each
Uploading Stop Motion Animations to Dropbox (Day 4 and 5)

Make sure you upload Day 4’s animations after camp on Day 4 and Day 5’s animations after camp on Day 5. Trying to complete the uploads for both days on Day 5 will be time-consuming (and tight if it is the last day of camp).

1) Set up your workspace and a tracking system

- Work in an area with a strong WiFi signal. Use the camp office if there is not WiFi in your classroom.
- Set up an “assembly line” with the iPads on the table in front of you. Working systematically will save lots of time.
- Put a Post-it note on each iPad.
- Open the Stop Motion app Library.

- Count the number of videos you will be uploading for each iPad and make a check box (or other annotation) for each on the Post-its. This will help you track where you are in the uploading process once you get started.
2) Upload the first video on each iPad to Dropbox

- Tap the thumbnail of the first video to select it. The selected video will appear on screen.

- Tap the “Share” button on the menu bar and choose Dropbox.

- You should have already logged in to your Dropbox account as part of your Setup Day tasks, but if you haven’t, the app will automatically prompt you to log in to Dropbox the first time you upload a video. Dropbox login info is included after these directions.
- Choose export format Large - 540p from the pop up menu and tap “Share.”

- The file will begin uploading.
- Make a check on your Post-it note check box to track that you’ve uploaded one video.
- As the file uploads, move on to the next iPad and repeat the above steps.
3) Continue uploading videos
   • When the first animation video file has uploaded, click “Done” to exit the upload pop-up.
   • Tap the small “Back” arrow on the top left hand side to go back to the library.
   • Continue cycling through all the iPads, checking off all boxes, until all animation files have been uploaded.

4) Find the Stop Motion video files in Dropbox
   • IMPORTANT! The Stop Motion app automatically uploads files to a Dropbox folder called Stop Motion Studio. You need to find the files and move them out of this folder into your camp’s Dropbox folder, so parents can access the files. If you don’t do this parents and campers won’t have access to them after camp.
   • Exit the Stop Motion App and click on the Dropbox App on the home screen.
   • Select the Files view structure at the bottom menu bar
   • Tap on the Apps folder.
   • Tap on the Stop Motion Studio folder. All the camper videos you just uploaded should be here.
5) Select all the videos to begin the process of moving them

- Tap the "•••" More icon at the top of the bar.

- Tap "Select." Empty checkboxes will appear next to each movie.
- Check them all.

- Click the “Move” button at the bottom right.
- It will prompt you to choose a destination. Navigate to your camp’s Dropbox folder by tapping the back arrow in the top bar twice, once to get back to Apps and once to get back to Files.

- Then select Camp Galileo and your camp’s folder. For example: CG Almaden
5) Create a folder for the week
   • Tap the “Create Folder” button in the bottom left corner.
   • Enter the dates for the week as the folder name. For example: July 5-8.
   • Select “Create”

6) Move the files into the newly created folder to complete the moving process
   • The folder is now created, but still empty.
   • Click “Move” in the bottom right corner.
   • Once you do this Dropbox automatically moves the files AND takes you back to the folder you started in (Stop Motion Studio), which is now empty. To confirm the files are now in the right folder (the one you just created) click on Files > Camp Galileo > your camp’s folder > the folder for the week you created

7) If you are teaching this theme twice, delete all camper videos from the Stop Motion App
   • We recommend leaving camper animations on the iPads for at least one week before deleting just in case there are any issues with Dropbox. However, you should delete the files from your first week before you teach this theme again. This way you will only have new camper videos in the app, which will make it much easier to keep track of which videos you need to upload.
   • Select a video.
   • Select the trashcan icon. Confirm you want to delete the video.
   • Repeat for all the videos.
   • Note: This is an easy task which any TL or SI can help with.
# Dropbox Login Information

To log in to Dropbox on your iPad, click on the Dropbox icon.  
The user name is your OC’s email account.  
The password for these accounts is: **GSQ2016!**

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