GALILEO MAKERS: TOYS
CAMP GALILEO
2016 NEBULA ART
(For rising kindergarten campers)

This curriculum was developed by Galileo Learning in collaboration with the Maker Education Initiative.

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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](image)

**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!
Day 1: Stick Dice

The “Stick Dice” game is a variation on a traditional game created and played in a number of Native American tribes, including the Navajo, Pomo and Arapaho people. Today’s maker inspiration comes from Scott Shoemaker and his Seenseewinki project.

Today, campers will create their own versions of the Stick Dice game by adding patterns with oil pastel to six craft sticks and going over all of them with a wash of watercolor. They will use the same oil pastel and watercolor-resist technique to decorate the box that holds all the game pieces.
Today’s Project: At-A-Glance

Add patterns with oil pastel on one side of 6 craft sticks

Set of 6 jumbo craft sticks, each with a different pattern in oil pastel

Paint with liquid watercolor on both sides of each stick

Patterned craft sticks, painted with liquid watercolor on both sides

Add patterns with oil pastel to the lid of the game box

Game box lid decorated with a variety of patterns in oil pastel
Paint the patterned box lid with liquid watercolor

Lid of game box with oil pastel patterns and liquid watercolor
Teaching the Lesson: Overview

OUR SECRET SAUCE: THE G.I.A.

KNOWLEDGE FOCUS

SKILLS AND TECHNIQUES: Creating Patterns with Limited Elements
Campers learn that using 6 basic lines and shapes in different ways can create a wide range of unique patterns, and try their hands at generating multiple patterns by using lines and shapes in a new way each time.

Why? – While many Nebulas may have created patterns before, being given the constraint of creating multiple, unique patterns using 6 lines and shapes may seem limiting at first. They may not immediately see how they can use lines and shapes in new ways. Introducing campers to the idea of changing the size, direction, and length of the lines and shapes gives them a new technique for generating a greater number of unique patterns and strengthens their understanding of line and shape.

HISTORICAL CONTEXT: Native American Games
Campers learn that today’s stick dice game is similar to one that’s been played by Native Americans for generations.

Why? – It’s important for campers to understand and respect the origin of the traditional game, and to understand that this project is inspired by a real game created and played by children in specific cultures.

PROCESS FOCUS

GENERATE IDEAS: Group Brainstorm
As a class, campers brainstorm multiple ways to use limited lines and shapes to create different patterns. These ideas are captured on the board for campers to reference later.

Why? – Brainstorming as a class will expose campers to a wider variety of ideas and give them practice thinking about ways to make each pattern uniquely different. While campers may not have a hard time generating 6 different patterns on their own, they are more likely to stick to basic designs without being supported to push past their first pattern ideas and find new and interesting ways to use the lines and shapes they’ve chosen.

MINDSET FOCUS

BE VISIONARY: I imagine things that don’t exist yet.
Campers imagine and create six unique patterns using a limited set of lines and shapes, noting what kind of patterns they’ve already created in order to ensure that they are making original designs each time.

Why? – Supporting campers in envisioning totally different ways to use the same lines and shapes is an age-appropriate challenge that will give Nebulas some practice designing with constraints as well as stretch and strengthen their understanding of line and shape.

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>Time</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><strong>Guided Activity: Pattern Brainstorm &amp; Oil Pastel/Watercolor Demo</strong></td>
<td>15 min</td>
</tr>
<tr>
<td>- Discuss the origins of the stick dice game</td>
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<tr>
<td>- Introduce the 3 lines and 3 shapes campers will use to make patterns</td>
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<tr>
<td>- Demo and discuss multiple ways to create different patterns</td>
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<tr>
<td>- Guide campers to brainstorm patterns and draw them on the board</td>
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<tr>
<td>- Demo drawing patterns on the craft sticks with oil pastel</td>
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<tr>
<td>- Demo making a watercolor wash</td>
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<tr>
<td><strong>Independent Work Time: Creating the Stick Dice</strong></td>
<td>25 min</td>
</tr>
<tr>
<td>- Draw patterns in oil pastels on one side of all 6 craft sticks</td>
<td></td>
</tr>
<tr>
<td>- Paint a liquid watercolor wash on both sides of each stick</td>
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</tr>
<tr>
<td>- If time, draw patterns in oil pastels on the box lid and paint over them with a watercolor wash as well</td>
<td></td>
</tr>
<tr>
<td><strong>Clean Up</strong></td>
<td>5 min</td>
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<tr>
<td><strong>Wrap Up</strong></td>
<td>5 min</td>
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<tr>
<td><strong>Transition</strong></td>
<td>5 min</td>
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</tbody>
</table>

**Timing Notes**
Campers are on track so long as they’ve completed six stick dice with different patterns on one side.

If campers or groups are behind
- It’s not essential that they paint all their sticks. They game will still be playable with unpainted sticks.

If campers or groups are ahead
- As mentioned in the lesson, campers can use the same pattern and watercolor technique to decorate the lids of the boxes that will hold their stick game pieces.
- If campers finish the box lids, they can decorate the bottom part of the box as well.
## Teaching the Lesson: Play-by-Play

### Welcome to Art (10 min)

<table>
<thead>
<tr>
<th>Task</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Welcome campers, introduce the theme, and make a quick story connection</strong></td>
<td>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.</td>
</tr>
</tbody>
</table>
| **Set expectations about the space and materials** | Important to set clear expectations for the whole week. Go over daily procedures you’ll want campers to be familiar with; some ideas:  
  - What they do when they first come in  
  - What materials they can and can’t touch  
  - How they treat plastic (leave it on; don’t poke holes in it!)  
  - How they treat materials  
Where they put finished projects |
| **Set expectations about behavior in the classroom** | Come up with agreements about  
  - How everyone can stay safe  
  - How campers can make sure they all have fun  
Emphasize respecting you, other staff, and each other |
| **Introduce the GIA** | Introduce the idea of being an innovator:  
  - 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!  
Point out your Innovator’s Process poster and quickly intro the Process:  
  - Don’t go over each step in detail now  
  - 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.  
Point out your Innovator’s Mindset poster and intro the Mindset:  
  - Again don’t go over each Mindset element in detail now  
  - Ex: This is how good innovators think and act. They try new ideas, they work together, and they don’t give up!  
Ask campers if they’re ready to innovate! |

### Introduction (5 min)

<table>
<thead>
<tr>
<th>Task</th>
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</table>
| **Introduce the idea of makers and making** | Announce this week is all about makers  
  Makers are people who make things themselves  
  - There are all kinds of makers  
  - Game makers, tool makers, clothes makers, food makers, etc.  
This week campers will be toy makers who make their own toys!  
  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! |
Give context for today’s project: Introduce stick dice

Kids from all cultures, and across hundreds of years, have made toys to play with, and we will too!

Today we’ll make a game that is inspired by a traditional Native American game called Stick Dice; it’s like a counting game.

Show your six sticks and point out that one side is plain and the other has patterns.

Quickly show campers how to play with your set of sticks (instructions are also on the Stick Game: How to Play copy)

- Drop sticks
- Count how many sticks landed with the pattern facing up
- Gather that number of mini craft sticks
- Explain that the next person then drops their sticks and counts how many are pattern side up, and takes that number of mini craft sticks
- The first player to gather 10 mini craft sticks wins

Build excitement and give an overview of today’s project

To make our own version of the game we will make patterns on six large craft sticks with oil pastel

Each stick will have a different pattern.

Then we’ll paint each stick with watercolor; the oil pastel will still show through the watercolor.

We’ll also get a box to put all our pieces in!

★ Introduce the Innovator’s Mindset: BE VISIONARY

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 visionary. This means imagining new things. We’re going to keep an open mind as we imagine six completely different patterns using the same set of lines and shapes. You might be surprised how many design combinations there are even with a small number of options!

Introduce campers to a maker who created his 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.
Guided Activity

Pattern Brainstorm & Oil Pastel/Watercolor Demo (15 min)

Define patterns and show examples of patterns

Many Native American blankets, pottery, jewelry and other objects are decorated with patterns

A pattern is a design with repeating parts

Patterns can have one, two, three or more repeating parts

Draw this pattern (or something similar with one element) on the board

- Ask campers: *Is this a pattern?* (Yes!)
- Say the pattern out loud, “*Circle, circle, circle, circle…*”

Draw a two-element pattern on the board

- Ask campers: *Is this a pattern?* (Yes!)
- Say the pattern out loud, “*Circle, triangle, circle, triangle…*”

Finally, draw a three-element pattern on the board

- Ask: *What about this, is this also a pattern?* (Yes!)
- Say this pattern out loud, “*Circle, striped lines, triangle, circle, striped lines, triangle…*”

These are all patterns! We’re going to make lots of patterns today
Observe and discuss Native American patterns

Show the Native American Art with Patterns and the Native American Pattern Samples color copies

Point out the different objects and their tribes, and have campers notice what lines and shapes can be seen on each

Discuss what lines and shapes they see in the pattern samples

These kinds of patterns were also used to decorate the Stick Dice game that we will be inspired by today

Introduce the 3 lines and 3 shapes that will be used for making patterns on their sticks

Campers will think of different ways to make patterns from the same 6 shapes and lines

They can use 3 shapes; draw them on the board
  • circle
  • triangle
  • square

They can use 3 kinds of lines; draw them on the board
  • straight
  • wavy
  • zigzag

Discuss different ways that lines can look

Lines can look lots of different ways
  • Short or long

  • Going up and down
Discuss different ways that shapes can look

• Going side to side

Shapes can also look different

• Big or small

• Empty or filled with color or lines

• Going in different directions

★ Support BEING VISIONARY and explain that there are many ways to make patterns by using lines and shapes differently

Because there are so many ways to use lines and shapes, there are tons of possibilities to create different patterns!

In fact, we could even make three different patterns using the same line and shape if we did something different each time

Show campers three different ways they could make a pattern with a triangle and a curvy line
★ Support BEING VISIONARY and GENERATING IDEAS

Lead campers through a brainstorm to come up with 6-8 unique patterns

Making six totally different patterns on each stick is a great opportunity to practice being visionary

We’re going to help each other out and brainstorm some patterns together before we make them on our own

Have campers suggest a line and a shape

- Ask campers to come up with at least 2 different ways to make a pattern using this line and shape
- Draw them on the board

Repeat this process with different pairs of lines and shapes until you have at least 6-8 (or more!) pattern ideas on the board

Remind campers that shapes and lines can look different and can be combined however they want

As you brainstorm, model being visionary by noticing how you’ve already used lines and shapes and push yourself to try something totally new

- Ex: Hmm, I used a shape filled with lines in the last two patterns. Is there something that I haven’t tried yet? Maybe big and small shapes with lines in between...

Demo how to add patterns to craft sticks with oil pastel

Campers will make these patterns with oil pastels on ONE side of their jumbo craft sticks

The pattern should go from one end of the stick to the other

Campers should press firmly but not so hard that the oil pastel is crushed

Demo adding a pattern with two different colors

Demo how to arrange finished sticks while working

Show campers how to keep blank sticks in one pile and line up completed sticks to see the different patterns created
<table>
<thead>
<tr>
<th><strong>Demo how to add the watercolor wash to finished sticks</strong></th>
<th>This will help campers remember what kinds of things they’ve already done so they can be sure they are making a totally new pattern each time</th>
</tr>
</thead>
<tbody>
<tr>
<td>When campers have finished all 6 sticks with 6 different patterns they will add liquid watercolor to make them really colorful</td>
<td>When campers have finished all 6 sticks with 6 different patterns they will add liquid watercolor to make them really colorful</td>
</tr>
<tr>
<td>Watercolors will be at a paint station; point this out to campers</td>
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</tr>
<tr>
<td>Demo how to lay all the sticks on a paper towel on top of a piece of 9 x 12&quot; cardboard</td>
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</tr>
<tr>
<td>Explain that the paper towel helps absorb the paint, so the sticks need to stay on the paper towel</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Discuss adding pattern and watercolor to the box lid</strong></th>
<th>Explain that the oil pastel will resist, or push away, the watercolor, so their designs will still show after they’ve been painted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demo dipping a brush in watercolor and using smooth brushstrokes to add paint to BOTH sides of a stick</td>
<td>Demo dipping a brush in watercolor and using smooth brushstrokes to add paint to BOTH sides of a stick</td>
</tr>
<tr>
<td>To change colors, rinse brush in water and dry on paper towel before dipping in new color</td>
<td>To change colors, rinse brush in water and dry on paper towel before dipping in new color</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>If they have time, campers can add oil pastel patterns and a watercolor wash to the lid of the box that will hold the game pieces</th>
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<tbody>
<tr>
<td>Campers can ask an adult for the lid when they are finished with their sticks</td>
<td>Campers can ask an adult for the lid when they are finished with their sticks</td>
</tr>
<tr>
<td>Encourage campers to make patterns that go from end to end, just like their sticks</td>
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</tr>
<tr>
<td>Show campers the lid and pretend to add patterns; you may not have enough for your own sample box (or show them a finished sample if you have one from a previous rotation)</td>
<td>Show campers the lid and pretend to add patterns; you may not have enough for your own sample box (or show them a finished sample if you have one from a previous rotation)</td>
</tr>
</tbody>
</table>
★ Review the challenge of making 6 different patterns and what campers can do to practice BEING VISIONARY

Review next steps:
- Oil pastel patterns on one side of 6 jumbo craft sticks
- Watercolor wash on both sides of 6 jumbo craft sticks

Remind campers that they can use different lines and shapes each time, or use the same lines and shapes in different ways

The goal is that no two patterns look the same

Remind campers that they can use pattern ideas from the group brainstorm to get started if they want

Look at the patterns they’ve already created and think about how to make the next one totally different from the others

Ask campers if they think they can come up with 6 unique patterns for their stick dice games

Independent Work Time
Creating the Stick Dice (25 min)

<table>
<thead>
<tr>
<th>What campers will do: Add different patterns to one side of 6 jumbo craft sticks</th>
<th>CREATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Use oil pastels to draw a pattern from end to end on one side of a craft stick.</td>
<td></td>
</tr>
<tr>
<td>2. Place the completed stick to the side, pattern side up.</td>
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</tr>
<tr>
<td>3. Repeat the process to complete all 6 sticks with totally different patterns.</td>
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</tr>
<tr>
<td>4. When all 6 are complete, go to the painting station and add liquid watercolor to BOTH sides of all 6 sticks.</td>
<td></td>
</tr>
<tr>
<td><strong>Extension</strong></td>
<td></td>
</tr>
<tr>
<td>Add oil pastel patterns to the box lid and paint over it with watercolor.</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Facilitate CREATE</th>
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</thead>
<tbody>
<tr>
<td>Circle the room, supporting campers in following patterns on their sticks and creating different patterns on each stick</td>
<td></td>
</tr>
<tr>
<td>Make sure campers are only creating a pattern on one side of their jumbo craft sticks</td>
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</tr>
</tbody>
</table>
Keep an eye out for watercolors getting muddy and water getting dirty

➤ Have your TL help out with the paint station; as campers are ready to paint, give them the 9 x 12” cardboard covered with paper towels and write their names; help them lay out their 6 sticks for painting

Facilitate the Extension

If campers have extra time, give them a box lid to pattern and paint
Be sure to write campers’ names on the lids if they choose to work on them

★ Support BEING VISIONARY

Remind campers to pause between each stick, look at the previous patterns and think up a new pattern that they haven’t used yet

Ask guiding questions that support being visionary:
  • How can you be sure that you haven’t repeated a pattern?
  • What ways can you think of to make a new pattern using the same elements? What ways can you make a new pattern using different elements?
  • How can you change how the line or shape looks?
  • What patterns do you see on the board that you like?

Clean Up (5 min)

Clean Up

Have campers drop their dirty brushes in the bucket
Make sure oil pastels are back in boxes (keep the lids off)
Take off smocks and wash hands.
➤ Have your TL help with rinsing brushes and replacing/refilling paints and water
➤ If painted sticks are dry, TL can transfer them to game boxes for each camper, and write their names inside the boxes

Lesson Wrap Up (5 min)

★ Summarize the importance of BEING VISIONARY and have campers recall if/how they practiced this today

Recognize campers’ hard work in being visionary and creating so many different patterns on the stick dice!

Highlight effect of practicing Mindset during today’s project
  • Ex: One thing that helped us create so many interesting patterns was being visionary and coming up with lots of suggestions to make new and different patterns.

Have campers wear their visionary goggles (fingers in circles around eyes) if they practiced being visionary today by:
  • Seeing possibilities for different patterns and suggesting them during the brainstorm
  • Making sure they used a new pattern for each of their stick dice

If applicable recognize specific campers for exhibiting above behavior

Review why reflection is important for innovation
  • Ex: Innovators are always looking for new and interesting ways to do things differently. When we worked to see and create different patterns for our sticks, we were using our powers of being visionary!
### 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 his toy? How?

If there’s a relevant Q&A read/revisit it now.
Lesson Materials

* (starred) materials appear multiple times in this list

Copies

- copy, color, Native American Pattern Samples (2 per classroom)
- copy, color, Native American Art with Patterns (2 per classroom)
- copy, B&W, Stick Game: How to Play (1 per 2 campers)
- copy, color, Maker Connection (2 per classroom)

General/Adhesives/Tools

- container, plastic, deli, 16 oz., for water for painting (1 per 2 campers)
- smocks, for painting with watercolor (1 per camper)
- paintbrush, flat, 1" (1 per camper)
- towel, paper, roll, sheet, for lining cardboard sheet and absorbing excess paint (3 sheets per camper)
- bucket, 5 gal., snap top, for dirty brushes (1 per classroom)

Required Materials

Guided Activity

- marker, dry erase, asst. colors, set of 4, for drawing shapes/patterns (1 per classroom)

Patterning

- craft stick, jumbo, 1 x 8" (6 per camper, plus extras)
- pastel, oil, asst. colors, set of 12 (1 set per 4 campers)

Painting

- paint, watercolor, liquid, yellow (1 tsp. per 2 campers)
- paint, watercolor, liquid, red (1 tsp. per 2 campers)
- paint, watercolor, liquid, orange (1 tsp. per 2 campers)
- paint, watercolor, liquid, blue (1 tsp. per 2 campers)
- paint, watercolor, liquid, turquoise (1 tsp. per 2 campers)
- paint, watercolor, liquid, purple (1 tsp. per 2 campers)
- tray, paint, 6 well (1 per 4 campers)
- cardboard, corrugated, 9 x 12", to use as tray for painting sticks (1 per camper)

Game boxes & pieces

- box, jewelry, kraft, 7 x 5.5 x 1" (1 per camper)
- craft sticks, mini, asst. colors, 3", to use as counting sticks to play game (15 per camper)
- rubber band, 3.5 x 1/8", to hold game box together (1 per camper)

Materials Preparation

Use a paper cutter to cut Stick Game: How to Play sheet in half (1 half per camper).

Place 15 mini colored craft sticks and 1 set of instructions in each box (1 per camper). This will be a complete set for campers after they add their finished, painted stick dice.

Create a sample set of patterned and painted stick dice to use during the demo.

If needed, peel back paper on the oil pastels. Use an X-acto knife to slice the paper and it will come off easily.
Advance Materials Preparation
Start assembling the ribbon wand handles for Day 2 (details in the Day 2 prep). This prep is intensive and it’s recommended that you start now.

Setting Up the Space
Set the patterning materials at each desk:
- jumbo craft sticks (6 per camper, plus extras if needed)
- oil pastels (1 set per 4 campers)

Set up 1-2 paint stations depending on space (see Materials Management for details):
- 6 well paint tray (fill with paint in the morning) (1 per 4 campers)
- 9 x 12” cardboard with 2 paper towels on top (1 per camper)
- deli container for water (fill in the morning) (1 per 2 campers)
- extra paper towels for drying and rinsing brushes
- 1” paintbrush (1 per camper)

Gather materials for the Demo & Discussion:
- your sample Stick Dice game
- set of 6 craft sticks, oil pastels
- watercolor painting materials, including cardboard sheet with paper towels
- a sample of the box lid

Put up the following color copies on your copies display board:
- Native American Pattern Samples
- Native American Art with Patterns
- Maker Connection

Morning Of Preparation
Pour paint in paint wells (2 tsp. of each color per tray) at paint stations.

Fill deli containers with water at paint stations.

Fill a bucket about ¼ full with water so campers can drop their dirty brushes in during Clean Up.

Notes
Materials Management
If classroom space is limited, be prepared with at least one paint station for campers who are ready to paint first. Be prepared to bring paint materials to table groups as campers finish patterning if there is not enough space for everyone to move to a paint station.

Save the 9 x 12” cardboard for the next time you teach this theme.

On the Board
Mindset of the Day
BE VISIONARY – I imagine things that don’t yet exist.

Clear an area on the board for the patterning demo and brainstorm.
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:

- Manage a paint station; as campers are ready to paint, give them the 9 x 12" cardboard covered with paper towels and write their names; help them lay out their 6 sticks for painting
- Rinse brushes during Clean Up; if watercolors have been mixed during painting, rinse trays and refresh with more paint and fresh water in deli containers
- If stick dice are dry at end of rotation, place them in game boxes; write campers’ names inside the boxes
Day 2: Ribbon Wands

Today campers dip dye two strips of fabric, and then experiment with saturation by dripping water and/or more dye onto them, watching to see how it affects their designs. Tomorrow (after they dry) these strips of fabric will get attached to a wand handle to become ribbon dancing wands.
Today’s Project: At-A-Glance

Roll ribbon

Keeping ribbon straight and tight while rolling it up like a snail

Dip ribbon into two colors of dye

Dipping each end of ribbon roll into different watercolor, gently “dotting” it up and down in the dye while counting to 10

Unroll ribbon onto cardboard

Ribbon carefully unrolled on 24 x 36” cardboard
Drip water and/or more dye onto the ribbon using pipettes

Using pipettes to drip water and/or more dye to experiment with levels of saturation on ribbon

Repeat the process to create a second ribbon

Second ribbon laid next to the first
Teaching the Lesson: Overview

OUR SECRET SAUCE: THE G.I.A.

KNOWLEDGE FOCUS
CONCEPTS & FACTS: Saturation
Campers learn what saturation is, and how dye and water will affect the saturation of their fabric ribbons.
Why? – Understanding saturation is crucial for campers to effectively notice what’s happening to their ribbons as they add more water and dye.

SKILLS AND TECHNIQUES: Fabric Rolling
Campers learn and practice how to roll their fabric strips so they are straight and tight.
Why? – Rolling the fabric tightly, in a straight line, may be difficult for some Nebulas as it requires hand-eye coordination and focus. However, successfully making a tight, straight fabric roll will make it easier for them to dye their fabric, and ensure that they get an even amount of both dye colors on their fabric. Be sure to support Nebbies with this key technique.

PROCESS FOCUS
GENERATE IDEAS: Scavenger Hunt
Campers walk around the classroom while the LI calls out things for them to search for by observing their teammates’ ribbons. Campers then notice parts of their own ribbons, and consider what things they want to try for the second ribbon.
Why? – Because it’s so much fun to drip water and dye onto their ribbons, it’s likely that Nebulas may just keep dripping and will not stop to notice what is actually happening. This Scavenger Hunt game gives campers a fun way to reflect on the process, incorporate what they’ve learned about saturation, and notice how other campers are using dye and water, ultimately giving them ideas for the second ribbon.

MINDSET FOCUS
BE REFLECTIVE – I take time to think about what is and isn’t working in my design.
Campers pay careful attention to the effects of their actions as they notice how the level of saturation in the ribbon changes after each new drop of water or dye. They consider whether they like the effect, and decide what their next step should be based on this.
Why? – Nebulas will naturally just want to keep adding more drops of water or dye onto their ribbons, without much thought about what’s happening to the design and whether they like how it looks. This challenge helps campers notice the effect of each drop, and be more intentional about how they are using water and dye to end up with something they really like.

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>Demo &amp; Discussion: Ribbon Dancing and Saturation</strong></td>
<td>10 min</td>
</tr>
<tr>
<td>□ Introduce ribbon dancing</td>
<td></td>
</tr>
<tr>
<td>□ Demo and discuss saturation</td>
<td></td>
</tr>
<tr>
<td>□ Demo rolling a ribbon, dipping it in dye, and laying it out</td>
<td></td>
</tr>
<tr>
<td>□ Demo using pipettes to drip water and dye onto a ribbon</td>
<td></td>
</tr>
<tr>
<td><strong>Independent Work Time: First Ribbon</strong></td>
<td>10 min</td>
</tr>
<tr>
<td>□ Roll the first ribbon</td>
<td></td>
</tr>
<tr>
<td>□ Dip the ribbon roll into 2 colors of dye and lay it on cardboard</td>
<td></td>
</tr>
<tr>
<td>□ Use pipettes to drip water and dye onto the ribbon</td>
<td></td>
</tr>
<tr>
<td><strong>Guided Activity: Scavenger Hunt</strong></td>
<td>10 min</td>
</tr>
<tr>
<td>□ Have campers observe each other’s ribbons and search for specific things when prompted</td>
<td></td>
</tr>
<tr>
<td>□ Have campers return to their seats and decide how they want to saturate the second ribbon</td>
<td></td>
</tr>
<tr>
<td><strong>Independent Work Time: Second Ribbon</strong></td>
<td>10 min</td>
</tr>
<tr>
<td>□ Roll the second ribbon</td>
<td></td>
</tr>
<tr>
<td>□ Dip the ribbon roll into two colors of dye and then lay it on cardboard</td>
<td></td>
</tr>
<tr>
<td>□ Use pipettes to drip water and dye onto the ribbon</td>
<td></td>
</tr>
<tr>
<td>□ (Optional) If time, decorate the wand handle</td>
<td></td>
</tr>
<tr>
<td><strong>Clean Up</strong></td>
<td>10 min</td>
</tr>
<tr>
<td><strong>Wrap Up</strong></td>
<td>10 min</td>
</tr>
<tr>
<td><strong>Transition</strong></td>
<td>5 min</td>
</tr>
</tbody>
</table>

### Timing Notes

Campers are on track so long as they have one ribbon dyed. Two is definitely preferred, but as long as campers have one ribbon, they will have a working ribbon dancing wand!

If campers or groups are behind
- Condense the scavenger hunt; don’t have campers walk around the room and look at each other’s ribbons, just have them reflect on their own ribbons with 1-2 guided questions.
- Skip the second ribbon entirely, or just have campers roll and dip their second ribbons (no dripping with pipettes).

If campers or groups are ahead
- Extend the scavenger hunt by having campers discuss what they found and what they liked.
- Have campers decorate their wand handles with markers.
Teaching the Lesson: Play-by-Play

Introduction (5 min)

Build excitement and give an overview of today’s project

Hold up an example ribbon wand that you made

Ask: Does anyone know what this is for?

• It’s a ribbon wand! These are used for a sport called rhythmic gymnastics, but also just for fun as a toy to dance and play with

Today we are going to make a ribbon wand with two dyed ribbons

Each ribbon will be dipped in two different colors of dye, and then we will drip water or more dye onto them to experiment with saturation

★ Introduce the Innovator’s Mindset: BE REFLECTIVE

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 reflective. This means thinking about our designs as we work on them. Dripping water and dye on fabric is so much fun we might forget to notice what’s happening as we do it! We’re going to pay careful attention to the effect of each drop so we can decide what to do next, and end up with a ribbon wand we really like.

Demo & Discussion

Ribbon Dancing and Saturation (10 min)

Introduce ribbon dancing

Ask campers: Have you played with a ribbon wand before?

• It is a common “Choice Time” activity at camp, so many campers may have played with them before

Campers might be familiar with ribbon wands as a toy, but ribbon wands are used by dancers all around the world

Show Ribbon – Rhythmic Gymnastics and Traditional Chinese Ribbon Dancing color copies

Notice the circles, loops, zigzags and waves that the ribbons make when the dancers move them

Campers’ ribbons won’t be as long as the ones in these photos, but they can still make shapes with them!
Hold up your sample ribbon wand and wave it in a circle for campers to see
Have campers move an arm like they are holding a ribbon wand if they are excited to make their own!

**Introduce dyeing**

Tell campers that today they will use watercolors to dye their ribbons
Have campers share if they know what it means if something has been dyed
- Color has been added to an object, changed to look different than it was
- Clothes, hair, paper, etc. are common things that are dyed

**Discuss saturation**

Explain that saturation means the amount of color something has
So in this case, how much dye it has!
Tell campers that more dye = more saturation/color, and less dye = less saturation/color

**Demo adding dye to fabric to make it more saturated**

Use a piece of fabric, blue liquid watercolor, and a scrap piece of cardboard for a visual explanation of saturation
Lay the fabric over a piece of cardboard
Point out that right now the fabric is plain white, it is not saturated with color
Fill a pipette with liquid watercolor
Be sure to call out that you need to squeeze the top in order to fill it up
Drip one or two drops of dye onto the ribbon

Notice that it is becoming saturated with color
Add more dye and notice how the saturation spreads, so now more of the fabric is saturated than before
Demo adding water to the fabric to make it less saturated

Explain that campers will add water to make their fabric less saturated
Fill a different pipette with water and drip some over the dyed area
Concentrate the water in one area to make an obvious change in the level of dye saturation

There is no right or wrong amount of saturation; it’s up to them
However, it’s important that they notice the level of saturation so they can decide whether they want to keep adding dye or add water instead

Demo how to roll the ribbon straight and tight

Tell campers that the first step in dyeing the ribbon is to roll it up like a snail making sure the fabric is STRAIGHT and TIGHT
  • Introduce a hand motion for straight and tight, have campers do it with you
  • They also need to roll it SLOWLY like a snail
  • Campers need to pay attention to their hands and their fabric
This is a key step in making sure we can dip our fabric in dye to get started
Demo intentionally rolling your fabric diagonally, and have campers point out what’s going wrong
Demo intentionally rolling your fabric loosely, and have campers point out what’s going wrong
Demo how to dip dye the ribbon in liquid watercolor

Tell campers they will dip the two ends of the ribbon roll (where they can see the snail) into two different colors of dye of their choice.

This will give the entire ribbon color.

Demo dipping the first end into one container of watercolor.

After 10 seconds, lift the ribbon out of the watercolor but keep it over the deli container; wiggle it around until it stops dripping.

Finish rolling a whole ribbon.
Flip the ribbon over, this time carefully holding the dyed part of the fabric, and place the un-dyed end into a second watercolor container.

Wait another 10 seconds before taking the roll out of the second container.

**Explain tips for dyeing ribbon**

Campers have the option of using red, blue, or yellow watercolor for dye. Tips for successful dyeing:

- If they want to use yellow as one of their colors, **always start with yellow**.
- If they add yellow after dipping in the red or blue, they will end up ruining the yellow color!
- Gently dab the ribbon up and down in the watercolor while counting to 10 to make sure it picks up a lot of dye.
- Once the 10 seconds are up, pick up the ribbon and wiggle it around until it stops dripping.

Remind campers that they are sharing dye so the containers have to stay in the plastic bin.

They might need to wait their turn to use a color.

**Demo how to unroll the ribbon onto cardboard**

Next they need to roll the ribbon out onto the piece of cardboard they share with a neighbor, so they can see the design.

Show them the 24 x 36" cardboard.

Each partner gets one long side of the cardboard, will need to fit 2 ribbons each on the cardboard.

Demo finding the end of the rolled ribbon and opening it a little bit.

Place the open end on the edge of the cardboard and carefully unroll the ribbon as straight as you can.
Remind campers that they’ll need to put another ribbon next to that one, so keep it close to the edge.

This ribbon already looks awesome, but it’s just the beginning!

Now they will get to change the saturation of the ribbon by using pipettes to drip water and dye onto it.

Remind to practice being reflective by noticing how each drop changes the level of saturation; then you can decide what amount of saturation you like best.

Demo dripping some water from a pipette onto your ribbon and verbalize what you notice:
- Emphasize noticing what you like or don’t like about the effect
- Ex: Neat, the water drop made this part of my ribbon less saturated! I like how it made this blue part lighter, that’s my favorite color. I don’t know if I like how it made that blue and yellow part mix though.

Keep dripping water onto your ribbon and verbalize what you notice:
- Create an area that is not very saturated with dye and creates a whole puddle of water on your ribbon
- Ex: Hmm, for a while when I added more water it was getting less saturated, but now it’s not really doing anything. And now it looks REALLY wet, like a puddle is sitting on top of my ribbon!

Tell campers that if they accidentally make a puddle, they can press a paper towel on top for 5 seconds.

Demo this and explain they can repeat with more towels if needed.

Explain that now part of your ribbon doesn’t seem saturated enough and you want to add more dye to make it more saturated.

Demo dripping dye onto this area, verbalizing what you notice:
- Ex: Wow, the part that I added this dye to is a lot more saturated now! I really like how this color is a lot brighter. I wonder what happens if I add another color? (mix 2 dye colors in one area) Cool, I love how these colors are mixing to make a different color!

Remind campers to use 1 pipette for each color.

If you want to switch from yellow to red, you have to return the yellow pipette to the yellow dye first and then pick up the red.
★ Model BEING REFLECTIVE as you demo dripping too much dye from pipettes onto the ribbon

Keep adding more dye, of multiple colors, to the same area until it starts to look dark/murky and verbalize what you notice:

- Ex: Huh, for a while when I added more dye it was changing the color and making it more saturated (more colorful). But now it’s turning dark and I don’t like it very much. Maybe I added too much dye.

Demo using a paper towel to get rid of some of the extra dye, pressing it on top of the dye for 5 seconds

★ Review what campers can do to practice BEING REFLECTIVE today

It’s up to them to be reflective with this first ribbon as they are adding drops of water or dye, and notice what level of saturation they like best!

That will help them know what to do next; whether they want to add more water or more dye

Then they’ll have a chance to do it again with the second ribbon

Transition to the first Independent Work Time

Explain that they will work on the first ribbon for 10 minutes and then they’ll come back together for a super fun Scavenger Hunt before doing a second ribbon

Have campers put on smocks before they start working

Independent Work Time

First Ribbon (10 min)

<table>
<thead>
<tr>
<th>What campers will do: Roll and dye their fabric ribbons by dipping and dripping</th>
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<tr>
<td>1. Roll one 2.5 x 30” muslin ribbon into a tight and straight “snail.”</td>
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<td>2. Dip each end of the ribbon roll into two different colors of watercolor dye.</td>
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<td>3. Carefully roll out the ribbon onto one side of a 24 x 36” piece of cardboard.</td>
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<td>4. Drip water and/or more dye onto the ribbon using pipettes.</td>
<td></td>
</tr>
<tr>
<td>EVALUATE</td>
<td></td>
</tr>
<tr>
<td>5. Reflect on how the water/dye is changing the ribbon.</td>
<td></td>
</tr>
<tr>
<td>6. Continue dripping water/dye based on their likes and dislikes.</td>
<td></td>
</tr>
</tbody>
</table>

Facilitate CREATE

Help campers who need assistance with rolling

Make sure campers are keeping watercolor containers in the bin

Watch for watercolors as well as water containers that are getting muddy and replace when necessary

Help campers who need assistance with unrolling onto cardboard

Keep an eye out for ribbons that are getting really wet and suggest campers use paper towels to soak up some of the water

Remind campers to keep 1 pipette for each color, and not to mix them

➤ Have your TL help you write campers’ names on cardboard with Sharpie

★ Facilitate EVALUATE and support BEING REFLECTIVE

Remind campers to stop and notice how each drop of water/dye affects the ribbon

Recognize reflective campers; be specific about how they are being reflective
Ex: I noticed how you stopped to look at your ribbon as a whole, and made a decision to add more drops of water over here where it’s really saturated. Way to be reflective!

Ask guiding questions that support being reflective:
- Tell me about this area of your ribbon. Why did you make it more/less saturated?
- What level of saturation do you think you like best? Do you like it really saturated, or not very saturated?
- What do you notice happens when you add a drop of water/dye?
- What happens if you use a paper towel to soak up some of the water/dye over here?

Give campers a 1 or 2 minute warning before they will finish up this part

After 10 minutes, have campers put down all materials, stop working, and put their hands on their heads/behind their back/etc. to listen to the instructions for the Scavenger Hunt

Campers can continue working on the first ribbon after this activity if they aren’t completely finished

Facilitation Tip: Campers may ask to wash their hands right now but we are suggesting that you save any hand washing until the very end of the rotation in the interest of time, facilitation, and focus

Guided Activity
Scavenger Hunt (10 min)

Introduce the Scavenger Hunt activity
We’re going to do a super fun Scavenger Hunt to help us be reflective and notice what’s happening as we work

Explain that you will read off a series of things campers must find by walking around the room and looking at other people’s ribbons

Emphasize the importance of walking slowly and looking with your eyes only

When they find what you’ve called, campers can stop at that ribbon and give you a signal (waving a pretend ribbon wand, thumbs-up, pointing, etc.)

Support BEING REFLECTIVE
Spend 7-8 minutes having campers walk around the room

Ask campers to find:
- A very saturated color on a ribbon that they think looks good
- A not very saturated color on a ribbon that they think looks good
- A ribbon that has areas that are both really saturated and areas that aren’t very saturated
- An area on a ribbon that they like where two colors mixed
- Something they would like to try when they make the second ribbon

Make sure campers are actually rotating all around the room and keeping their hands to themselves
Support BEING REFLECTIVE

<table>
<thead>
<tr>
<th>Have campers return to their own ribbons and reflect on how they look</th>
</tr>
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</tr>
<tr>
<td>Ask campers to notice:</td>
</tr>
<tr>
<td>• Something they really like on their own ribbons</td>
</tr>
<tr>
<td>• Something they don’t really like on their own ribbons</td>
</tr>
<tr>
<td>• An area that is very saturated</td>
</tr>
<tr>
<td>• An area that is not very saturated</td>
</tr>
</tbody>
</table>

Transition to the second Independent Work Time

| Have campers give you a thumbs-up if they saw some awesome ribbons out there and are ready to make another one! |
| Tell campers they can repeat the process for the second ribbon |
➤ Have your TL help you pass out new ribbons to each camper

Independent Work Time

Second Ribbon (10 min)

<table>
<thead>
<tr>
<th>What campers will do: Roll and dye their second fabric ribbons by dipping and dripping</th>
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Extension

If campers are done early, they can use markers to decorate the handles of their ribbon wands.

Facilitate CREATE

Facilitate as described above with the first ribbon

Facilitate the Extension

Have wand handles prepped and sitting with markers on a table or easily accessible spot for campers who finish early

Make sure you explain that this is the handle for the ribbon wand that will hold their ribbons after they dry

Campers can decorate however they want
➤ If campers decorate wand handles, have your TL help to write campers’ names on the masking tape

★ Support EVALUATE and BEING REFLECTIVE

Facilitate as described above with the first ribbon
Clean Up (10 min)

Clean Up

**RIBBONS MUST BE DRIED FLAT AND NOT TRANSFERRED TO ANOTHER SURFACE**
- Hanging them to dry will cause the dye to run, ruining any designs campers made with pipettes today
- See Materials Management for more specific notes about drying

Have campers use paper towels to clean up any watercolor on tables or floors

Use the buckets for a hand-washing station

Have campers take off their smocks

➤ Have your TL help make sure campers’ names are written on cardboard next to their ribbons
➤ Have your TL and campers help refill deli containers of water and watercolors, as needed
➤ Have TL and campers help reset classroom with new 24 x 36” sheets of cardboard and muslin ribbons for the next rotation

Lesson Wrap Up (10 min)

★ **Summarize the importance of BEING REFLECTIVE and have campers recall if/how they practiced this today**

Recognize how much experimentation you saw in the levels of saturation campers tried today

Highlight effect of practicing being reflective during today’s project
- Ex: *One thing that helped us end up with such awesome ribbons was that we used our powers of reflection to notice the effect of each drop of water or dye and decide what level of saturation we liked best.*

Have campers pretend to squeeze a pipette and make a dripping sound if they practiced being reflective today by:
- Noticing how a single drop of dye or water affected the design
- Noticing when they liked a level of saturation
- Using a paper towel to take out some water or dye if they decided they added too much
- Trying something new on the second ribbon, or trying something again to try and get a better result

If applicable recognize specific campers for exhibiting above behavior

Review why reflection is important for innovation
- Ex: *Reflection is what helps innovators make improvements as they work, so they end up creating exactly what they imagine.*
# Get Ready!

## Lesson Materials

* (starred) materials appear multiple times in this list

### Copies
- copies, color, Ribbon – Rhythmic Gymnastics (2 per classroom)
- copies, color, Traditional Chinese Ribbon Dancing (2 per classroom)

### General/Adhesives/Tools
- container, plastic, deli, 16 oz., for holding watercolor & water (4 per 2 campers, 2 per instructor)
- marker, Sharpie, fine pt., black, for writing campers’ names on cardboard (1 per 8 campers)
- bucket, 5 gal., for washing hands (2 per classroom)
- towel, paper, roll, for soaking up dye or water on ribbons (8 sheets per camper)
- sponge, 3 x 4", for washing hands, clean up (1 per 8 campers)
- smocks (1 per camper)
- marker, asst. colors, set of 8, for decorating wand handles (1 set per 4 campers)
- rack, drying, 38 x 12 x 60", for drying ribbons (1 per classroom)

### Required Materials

#### Ribbon wand handles
- dowel, wood, 3/8 x 6" (1 per camper)
- clip, bulldog, 1", w/ large swivel hook (1 per camper)
- paper clip, jumbo, for attaching swivel clip to handle (1 per camper)
- tape, masking, 2" wide, for advance prep: taping paper clip to dowel (2" per camper)

#### Dyeing ribbon wands
- fabric, muslin, bleached white, roll, 2.5" x 100 yds., for ribbons (two 30" strips per camper)
- paint, watercolor, liquid, red, for dyeing ribbon (1 oz. per 2 campers)
- paint, watercolor, liquid, yellow, for dyeing ribbon (1 oz. per 2 campers)
- paint, watercolor, liquid, blue, for dyeing ribbon (1 oz. per 2 campers)
- pipette, plastic, 3 ml, for dripping water onto ribbons (4 per 2 campers)
- cardboard, corrugated, 24 x 36", for laying out ribbons to dye & dry (1 per 2 campers)
- pan, baking, aluminum, 12 x 10 x 2.5", for holding deli containers w/ watercolors & water (1 per 2 campers)
Materials Preparation

Assemble the ribbon wand handles (1 per camper, plus 1 sample for LI):

- Slip the end of the bulldog clip with swivel hook into a jumbo paperclip (1 per camper).
- Rip roughly 2" long pieces of 2" wide masking tape (1 per camper).
- Using the masking tape, attach the paperclip onto the end of a dowel, leaving some of the paperclip’s loop (where the swivel hook is attached) hanging over the end of the dowel.

Cut the muslin fabric roll into 30 inch strips (2 per camper, plus 1 per rotation for your demo) to make the ribbons.

Cut three smaller piece of fabric to use for the saturation demo: roughly 6" each.

Make a sample ribbon wand; dye 2 ribbons the day before so they have time to dry before your demo.

Advance Materials Preparation

Start assembling the Velcro wands for Day 3 (details in the Day 3 prep). This prep is intensive and it’s recommended that you start now.
### Setting Up the Space

Set the Independent Work Time materials at each spot:
- **24 x 36"** cardboard (1 per 2 campers)
- **30"** muslin ribbon (1 per camper, second ribbon will be passed out later)
- aluminum baking pan (1 per 2 campers), holding:
  - 4 deli containers, for red, blue, yellow paint and clean water (can fill in the morning)
  - 4 pipettes (1 for each deli container)
- paper towels (2 sheets per camper)

If you can’t fit all your campers on tables, some of them may have to work on the floor.
- Clear a space on the floor for the approximate number of campers, pieces of cardboard and aluminum baking pans.
- Secure baking pans and cardboard on the floor with little rolls of blue tape underneath so they don’t accidentally get kicked or knocked over.

Gather materials for the Demo & Discussion:
- example ribbon wand
- set of saturation demo materials (5-6" piece of fabric, scrap piece of cardboard, deli container with blue watercolor, deli container with water, pipette)
- set of dyeing materials (24 x 36" cardboard, 1 ribbon per rotation, paper towels; will use the water, dye and pipettes for this as well)
- Sharpies (for you and your TL to write campers’ names on cardboard)
- **30"** muslin ribbon, for you/your TL to hand out to campers after the Scavenger Hunt (1 per camper)

Set up a space for washing and drying hands
- 1-2 buckets with sponges inside (can fill in the morning)
- Pre-rip pieces of paper towel for campers to dry their hands

Have a plan for smock distribution: on chairs, in a pile on the floor, in a box, etc.

Put up the following color copies on your copies display board:
- Ribbon – Rhythmic Gymnastics
- Traditional Chinese Ribbon Dancing

Set up a materials station with the wand handle decoration materials.
- wand handles (1 per camper)
- markers (1 set per 4 campers)

If your drying rack isn’t already set up, set it up now so you have room for more ribbons to dry.

### Morning Of Prep

Pour watercolor and water into deli containers at table groups:
- deli container filled (roughly ¼" deep) with red watercolor (1 per 2 campers)
- deli container filled (roughly ¼" deep) with blue watercolor (1 per 2 campers)
- deli container filled (roughly ¼" deep) with yellow watercolor (1 per 2 campers)
- deli container filled (roughly ½" deep) with water (1 per 2 campers)

Fill up buckets with water.
Notes

Materials Management
Reminder: RIBBONS MUST BE DRIED FLAT AND NOT TRANSFERRED TO ANOTHER SURFACE. Do not hang ribbons to dry, or the dye will run and any designs campers made with pipettes will disappear. Projects should dry on the same 24 x 36" cardboard they were dyed on.

If you don’t have enough 24 x 36" cardboard and weren’t able to resupply in time, you can take your drying rack apart shelf by shelf and use each shelf like another 24 x 36" cardboard (1 per 2 campers).

If you need to consolidate drying projects, stack the cardboard with plastic cups between them so that the ribbons have room to dry.

If possible, consider setting up the drying rack or stacking the cardboard sheets outside to dry, so they will dry faster and not take up too much space in the classroom
- Make sure the ribbons are secure and cannot blow away.

Suggestions for Large Classes
Set up more buckets of water for washing hands.

On the Board

Mindset of the Day
BE REFLECTIVE – I take time to think about what is and isn’t working in my design.

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:
- Handing out second ribbons to campers after the Scavenger Hunt
- Writing campers’ names on their 24 x 36" pieces of cardboard
- If campers have decorated wand handles, help writing campers’ names on the wand handles – easiest spot is on the masking tape, where the jumbo paper clip has made a small flat area
- Refilling watercolor and clean water when needed
- Passing out paper towels to campers who are really messy, and encouraging them to soak up some of their extra water/dye with the paper towels
- Facilitating campers cleaning their hands quickly during clean up time
- Stacking cardboard/putting them on the drying rack
Today: Printing on Insect Bodies
Today campers explore printing with paints and other materials to decorate the bodies of a butterfly, bee, and ladybug for their mix-n-match Velcro insect wands.

What’s Next
Tomorrow (Day 4) campers make four butterfly wings with symmetrical designs, and add embellishments to all the pieces of their mix-n-match insect parts.
Today’s Project: At-A-Glance

Bingo daub the background of all 4 insect body parts

1 insect head (L round), 1 ladybug body (XXL round), 1 bee body (XXL oval) and 1 butterfly body (L oval) painted with bingo daubers

Practice printing bee stripes on a test sheet

Stripes painted with 1 x 3” cardboard strips and 1 x 2.5” craft stick pieces

Practice printing ladybug dots on a test sheet

Dots printed with 4” dowels and Q-tips
Print final markings on Woodsies

Bee and ladybug bodies painted with stripes and dots

If time allows, create bee wings

Bee wings decorated with Sharpie
Teaching the Lesson: Overview

OUR SECRET SAUCE: THE G.I.A.

KNOWLEDGE FOCUS

SKILLS AND TECHNIQUES: Printing with Mixed Media
Campers learn that printing with objects is an alternative way to making marks with a paintbrush, and understand that adjusting your printing technique will give you different results.

Why? – Nebulas may not have experience printing with different materials, and it may not have even occurred to them that they can use objects instead of paintbrushes to make specific kinds of marks. Additionally, Nebs may not understand that while printing with certain materials will give them certain results (Q-tips will make a dot, craft sticks will make a line), they can affect how this result looks by how they are using the material.

PROCESS FOCUS

TEST and EVALUATE: Insect Bodies Test Sheet
Campers test out all available printing materials to make insect markings on a sheet of paper, noticing which materials and techniques they like best, before printing on their Woodsies.

Why? – Nebulas have multiple options for objects to print with, and (probably) no experience printing with those kinds of objects. It is important for Nebulas to test out this new process before moving on to their actual projects, so they can practice being reflective and noticing how much paint they need, how hard they need to press, etc. By testing their materials ahead of time, Nebulas are much more likely to have a successful project in the end.

MINDSET FOCUS

BE REFLECTIVE – I take time to think about what is and isn’t working in my design.
Campers are thoughtful about the lines and dots they are making, taking the time to notice what techniques are giving them the results that they like best.

Why? – Without the reminder to be reflective, it’s likely that Nebulas will just rush into covering the test sheet instead of being mindful about what is and isn’t working. This challenge supports campers in taking their time and experimenting with the best technique for each material, ensuring that they can achieve the best results on their final projects.

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>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>5 min</td>
</tr>
<tr>
<td>Guided Activity: Insect Bodies</td>
<td>10 min</td>
</tr>
<tr>
<td>- Discuss insect body parts, shapes, and colors</td>
<td></td>
</tr>
<tr>
<td>- Have campers color ladybug, bee, and butterfly bodies and an insect head with bingo daubers</td>
<td></td>
</tr>
<tr>
<td>Guided Activity: Markings &amp; Material Exploration</td>
<td>25 min</td>
</tr>
<tr>
<td>- Introduce insect markings</td>
<td></td>
</tr>
<tr>
<td>- Demo using different materials for printing on bee and ladybug bodies</td>
<td></td>
</tr>
<tr>
<td>- Have campers practice making bee and ladybug markings on their test sheets</td>
<td></td>
</tr>
<tr>
<td>- Facilitate sharing and reflecting on the testing process</td>
<td></td>
</tr>
<tr>
<td>Independent Work Time: Markings &amp; Wings</td>
<td>10 min</td>
</tr>
<tr>
<td>- Print patterns on their ladybug and bee bodies, and if they want, on the butterfly</td>
<td></td>
</tr>
<tr>
<td>- If time: campers use Sharpie to create bee wings</td>
<td></td>
</tr>
<tr>
<td>Clean Up</td>
<td>5 min</td>
</tr>
<tr>
<td>Wrap Up</td>
<td>10 min</td>
</tr>
<tr>
<td>Transition</td>
<td>5 min</td>
</tr>
</tbody>
</table>

Timing Notes
Campers are on track so long as they have colored in all 4 Woodsie insect body parts with bingo daubers, and printed markings on both of their bug bodies.

If campers or groups are ahead
- Campers can add markings to their butterfly bodies or insect heads.
- Campers can create more than 2 wings at the bee wings station.
- Campers can decorate extra Woodsies from the jumbo and assorted Woodsie packs that are not being used in the next 2 days.
# 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>
| Build excitement and give an overview of today’s project | Today they are going to start on a 2-day project making a mix-n-match bug toy!  
• Will create the parts of a ladybug, bee and butterfly with Woodsies that they can then mix-n-match using Velcro  
• This means they can create completely unique new bugs to play with  
Show color copy of Mix and Match Bugs Pt 2 Project Sample |

- Today they will paint and print on their bug bodies

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

| 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 Reflective. This means stopping and noticing what is and isn’t working as we work. We will be trying some new materials to make prints today, so we’re going to take the time to practice and think about what things are giving us the results we want.* |

## Guided Activity

### Insect Bodies (10 min)

| Discuss the insect body parts they will make | Show *Insects* color copy  
Ask: *What different body parts do you see?*  
• Head, body, antennae, legs, wings, stingers, etc. |
Explain they will be making
- Butterfly, bee and ladybug bodies
- Butterfly wings, bee wings
- They will also make an insect head that can work on any insect

Discuss differences in insect bodies: color and shape

Show Bees, Ladybugs, and Butterflies color copies

Ask: What makes bumblebee, ladybug, and butterfly bodies different? What colors are they? What shapes are they?
- (Bees are yellow, ladybugs are red, butterflies are many different colors)
- (Bumblebee is more oval or teardrop, ladybug is round, butterfly is long with large wings)

Campers may point out that bees, ladybugs and butterflies have different markings as well

For now, focus on color and shape

You may need to refocus campers on the bodies of butterflies, not the wings

Show and discuss how campers will use the Velcro wands with bug body Woodsies attached

Show campers the prepared Velcro wands with the 4 Woodsies velcroed on

Point out which Woodsie will be which part
### Discuss painting the base color of the insects

Discuss painting the base color of the insects:

- Explain to campers that the first step will be for them to paint the base color of their insects.
- Remind campers that even though most bees are yellow, etc., they don't have to use those colors on their insects.
- They can be innovative and come up with unique new colors for their insects.
- Campers may point out that bees are yellow AND black.
  - Explain that they will add markings (the parts in black) onto their insect bodies right after this.
  - For this part, they can just make the insect body one color.
- Really emphasize that they are not making any lines or dots right now; this step is just to cover the entire Woodsie shape in a solid layer of color.

### Demo using bingo daubers

Demo using bingo daubers:

- Even though they will be painting today, this whole day they won't use ANY paintbrushes!
- Innovators use all kinds of materials to paint with, not just paintbrushes.
- Quickly introduce campers to using bingo daubers.
  - Gently dot the surface of the Woodsie with the bingo dauber until the paint starts to come out dark/bright.
  - Then start rubbing the dauber back and forth like you'd do with a paintbrush, very gently.
  - Squeeze gently if want more paint.

### Pass out materials and have campers paint all 4 bug body woodies with bingo daubers

- Have TL pass out the wands with Woodsies velcroed on and lunch trays of bingo daubers.
- Let campers know they have a few minutes to add color.
- Remind campers to fill in each Woodsie with just one color.
This will allow the bug’s markings to really stand out
Have campers put lids back on bingo daubers as they finish up
➤ Have your TL help you write names on campers’ cardboard as they are working

➤ Have your TL collect the Velcro wands and bingo daubers from campers
Make sure names are written on the cardboard so you know whose is whose!
Let campers know that they’re now going to experiment with ways to add markings to their bugs

Guided Activity
Markings & Material Exploration (25 min)

| Observe and discuss the markings on bumblebees and ladybugs | Point to Bees and Ladybugs color copies
Ask: What do you notice about the markings on a ladybug? On a bee?
• Ladybugs have spots for markings, can have few or many
• Bees have horizontal stripes that go across the body
• They never have just one mark; they repeat
• The marks are mostly black

| Introduce making marks by printing with materials | Will try printing markings onto their bugs using other materials instead of paintbrushes
Show campers the material options:
• cardboard strips
• craft sticks
• dowels
• Q-tips
Ask: If I want to make bumblebee stripes, which materials might I use?
• The edges of the cardboard strips, the edges of the craft sticks
Ask: If I want to make ladybug spots, which materials might I use?
• end of the dowel, Q-tips

| Support TESTING while you introduce the Insect Body Test Sheet | Since they are using new materials, it is important to try them out first by printing with all of them on the test sheet before moving on to print on their final Woodsies
Show campers the test sheet
• Point out that there are circles and ovals that are the same size as the Woodsies they just painted
• Ovals are for bees
• Circles are for ladybugs

| ★ Model BEING REFLECTIVE as you demo printing with cardboard and craft sticks to make bumblebee stripes | Will practice printing on all three bumblebee bodies
Dip the long side of a cardboard strip into an 8 oz. deli container with black tempera paint
Let campers know that it’s okay that the stripes go outside the edge of the body on the paper; this doesn’t matter when they are printing on the 3D
Woodsie shape

Print a few horizontal stripes before switching to the craft stick

Call out the opportunity to practice being reflective by paying attention to how each material prints

Verbalize what you notice with each print

• Ex: *Hmm, this stripe got smudged when I lifted the cardboard/craft stick. Let me try again to see if I can get the print just right by lifting it very carefully and holding onto the paper with my other hand.*

• Ex: *Hmm, this stripe turned out really thick. Do you think I can make it thinner if I put less paint on the craft stick? Let’s try it out!*

Demo trying again

Remind campers that this is their chance to experiment and find the best printing material and the best printing technique to make the bee stripes that they want

★ Model BEING REFLECTIV as you demo printing with Q-tips and dowels to make ladybug spots

Then will practice printing on all three ladybug bodies

Hold up a Q-tip and dowel

Demo dipping the round tip of a dowel into an 8 oz. deli container with black tempera paint

Print by placing the tip carefully inside of the ladybug outline on the test sheet

Print a few dots with the dowel before switching to a Q-tip

Verbalize what you notice with each print

• Ex: *Hmm, this dot didn’t turn out very round. Let’s see if I can make it more round by putting less paint on the dowel, or not pressing as hard.*

Demo trying again and paying closer attention this time

Again remind campers that the goal is to get the result they want; they should look out for what is and isn’t working

May need to try printing a few times before it turns out how they want
Discuss putting used printing materials back in the deli containers

When you’re done demoing, explain that all used printing materials should go back in the containers they came from

Ask: When I’m done with this dowel, can I leave it here on my paper? Can I leave it here on the table? Do I put it back with the craft sticks and cardboard? Where should I put it?
  • (No! The dowel goes back in the container of dowels and Q-tips, right where it came from!)

Being careful to put materials back where they came from will help keep themselves and the workspace clean and make things easier to share

Campers will also put on smocks before they start working

Dismiss campers to tables and have them put on smocks

Test sheets, paint and materials are at table groups

Help campers put on smocks before they start working

★ Support TESTING and BEING REFLECTIVE

Have campers practice printing stripes and spots on the Insect Body Test Sheet

Remind campers to pay attention to which direction the bumblebee stripes should go

It’s okay if the stripes don’t stay inside the lines, this won’t be an issue on the Woodsies

Encourage campers to work thoughtfully and think about how their prints are looking

Remind campers to print on all six bumblebees and ladybugs

Support campers to put materials back in the right containers

Ask guiding questions that support being reflective:
  • What happens if you use more or less paint?
  • What happens if you use a different material to make that mark?
  • Which print is looking the best to you? Why?

★ Support BEING REFLECTIVE

Have campers share what they discovered from their testing

Once most of your campers have finished, have everyone stop and put the materials back in their containers

Call out: Hands on top Campers: Everybody stop (or a similar rendition) to make sure all materials are out of camper hands, and all eyes are on you!

Make sure campers who are still working know that they will be able to keep printing right after this quick pause

Ask campers to point to their favorite bee stripes/ladybug dots

Ask: Why is that your favorite? What did you do to make it look like that?

Have campers notice what worked well and what could be done differently

Ask:
  • Did some of your prints smudge?
  • Do you like the prints where you pressed harder or more gently?
  • Do you like the prints with more or less paint?
  • Which material did you like best?

Explain the next steps for the Independent Work Time

When they are done with their test sheets, campers can raise their hands

An adult will pass their Velcro wands with their painted Woodsies back to them
Then they print markings on their Woodsie bumblebee & ladybug bodies using what they learned during the testing time

Review which shape is the ladybug body (XXL circle) and which is the bumblebee body (XXL oval)

Campers can print markings on the butterfly body if they want; not all butterflies have markings on their bodies

Briefly mention the bee wing extension
   • If there’s more time after printing, can draw bee wing designs with Sharpie
   • Adult will explain if they get to it
   • Will have time to do this tomorrow too

**Review what campers can do to practice BEING REFLECTIVE today**

Noticing what prints they like best from their test sheets, and being careful to copy those techniques on their final Woodsies

Even as they work on their final pieces, campers can continue to be reflective by:
   • Taking their time when they print
   • Continuing to notice if they are getting the kinds of markings they want
   • Changing their techniques if they want something different

Independent Work Time

**Markings & Wings (10 min)**

<table>
<thead>
<tr>
<th>What campers will do: Use available materials to print black markings on their insect bodies</th>
<th>CREATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Use cardboard strips and craft sticks to print black stripes on a bee body.</td>
<td></td>
</tr>
<tr>
<td>2. Use Q-tips and dowels to print black dots on a ladybug body.</td>
<td></td>
</tr>
<tr>
<td>3. Optional: Print markings on the butterfly body.</td>
<td></td>
</tr>
</tbody>
</table>

**Extension**

Use Sharpie to draw bumblebee wing designs on two L teardrop Woodsies.

Facilitate **CREATE**

➤ Have TL pass Velcro wands back to campers who have raised their hands to signify they are done with their test sheets

Make sure campers are putting their printing materials back in the same containers they came from

Wipe down printing materials that get extra messy

➤ Have TL help manage the Bee Wings Station

Facilitate the **Extension**

Campers who finish very quickly can move to the Bee Wing Station to draw bee designs with Sharpie on 2 large teardrop Woodsies

Explain this info to campers as they are ready
Point out the Bee Wings color copies at the station; can use this for inspiration

Be sure to put campers’ bee wings with their insect bodies or in their Stick Dice boxes so they don’t get lost

You can have campers put the Velcro dots on them now, do it for them, or have everyone add the Velcro dots tomorrow

★ Support BEING REFLECTIVE

Encourage campers to think about which markings they liked best from their test sheets and to try to replicate the same techniques on their final Woodsies

Encourage campers to stop and think after making each mark about how to make the next mark better, or how to make the same mark again

Recognize reflective campers; be specific about how they are being reflective

• Ex: I notice how you’ve changed your technique (are using less paint, etc.) after making a few smudgy prints. Way to be reflective!

Ask guiding questions that support being reflective:

• What happens if you use more or less paint?
• What happens if you use a different material to make that mark?
• Which print is looking the best to you? Why?

Clean Up (5 min)

Clean Up

Make sure campers keep all their finished Woodsies on their Velcro wands, including bumblebee wings, if applicable

If campers want to keep their test sheets, make sure they have names as well

Clean up wet paint on tables with paper towels/sponges

Have campers wash their hands in the bucket you filled with water

Make sure the dowels and Q-tips are back in their own containers, and the cardboard and craft sticks are in their own container

Replace any really messy printing materials as needed

Choose a few camper test sheets and final painted Woodsies to use during Wrap Up

Have campers take off smocks and put them on their chairs
Lesson Wrap Up (10 min)

★ Summarize the importance of BEING REFLECTIVE and have campers recall if/how they practiced this today

Recognize the many innovative markings you saw!

Highlight effect of practicing Mindset during today’s project

- Ex: One thing that helped us create so many beautiful markings on our bugs is that we used our powers of reflection while testing all the materials first! We noticed what was and wasn’t working so we already knew how to get the markings we wanted by the time we made our final designs.

Have campers flap their wings and buzz like a bee if they practiced being reflective today by:

- Trying all 4 materials (cardboard, craft sticks, dowels, and Q-tips)
- Noticing what they liked or didn’t like about the markings they were making
- Changing what they were doing if it wasn’t coming out the way they wanted
- Thinking about the markings they made on their test sheets and either copying or changing them for their final Woodsie designs

If applicable recognize specific campers for exhibiting above behavior

Review why reflection is important for innovation

- Ex: When you use your powers of reflection, you can make improvements as you work and create exactly what you’re imagining.
## Get Ready!

### Lesson Materials

* (starred) materials appear multiple times in this list

#### Copies
- copy, color, Insects (2 per classroom)
- copy, color, Bees (2 per classroom)
- copy, color, Ladybugs (2 per classroom)
- copy, color, Butterflies (2 per classroom)
- copy, b&w, Insect Body Test Sheet (1 per camper)
- copy, color, Bee Wings (2 per classroom)

#### General/Adhesives/Tools
- glue gun, mini, low temp, *for attaching wand handle to cardboard* (2 per classroom)
- glue stick, melt, mini (1 per 10 campers)
- tray, lunch, *for quickly distributing bingo daubers* (1 per 4 campers)
- container, plastic, deli, 16 oz., *for holding craft sticks & cardboard, and for holding dowels and Q-tips* (2 per 4 campers)
- smocks (1 per camper)
- bucket, 5 gal., *for hand washing* (1 per classroom)
- towel, paper, roll, *for cleaning paint & hands* (3 sheets per camper)

#### Required Materials

##### Wands
- craft stick, jumbo, 1 x 8", *for wand handle* (1 per camper)
- cardboard, corrugated, 6 x 6", *for wand paddle* (1 per camper)
- hook, adhesive back, square, 4 x 4", *for wand paddle* (1 per camper)

##### Insect bodies
- bingo dauber, blue, 4 oz., *for painting background of bug parts* (1 per 4 campers)
- bingo dauber, red, 4 oz., *for painting background of bug parts* (1 per 4 campers)
- bingo dauber, green, 4 oz., *for painting background of bug parts* (1 per 4 campers)
- bingo dauber, orange, 4 oz., *for painting background of bug parts* (1 per 4 campers)
- bingo dauber, purple, 4 oz., *for painting background of bug parts* (1 per 4 campers)
- bingo dauber, yellow, 4 oz., *for painting background of bug parts* (1 per 4 campers)
- loop, ¾" tape dot, black, adhesive back, Velcro *for back of Woodies* (6 per camper)
- Woodies, jumbo, (teardrop, oval, circle) *for wings, ladybug body, bee body* (1 XXL circle, 1 XXL oval, 2 XXL and XL teardrops per camper)
- Woodies, asst. shapes (teardrop, oval circle) *for wings, insect head, butterfly body* (1 L circle, 1 L oval, 2 L teardrops per camper)

#### Markings and material exploration
- paint, tempera, black, Sargent (2 tsp. per camper)
- container, plastic, deli, 8 oz., *for holding black paint* (1 per 2 campers)
- dowel, wood, 0.25 x 4", *for printing ladybug dots* (1 per camper)
- Q-tip, double tip, 500 pk., *for printing ladybug dots* (1 per camper)
- cardboard, corrugated, 1.5 x 18", *for printing bee stripes* (one 1.5 x 3" piece per 2 campers)
- craft stick, jumbo, 1 x 8", *for printing bee stripes* (one 1 x 2.5" piece per 2 campers)
- marker, Sharpie, fine pt., black, *for bumblebee wings* (1 per 4 campers)
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:
- 6 aluminum pie pans
- Woodsies, jumbo (teardrop, oval, circle); If you are teaching this theme twice, use half of the Jumbo Shape bags now
- Woodsies, asstd. shapes (teardrop, oval, circle); If you are teaching this theme twice, use half of the Assorted Shape bags now
- loop, ¾” tape dot, black, adhesive back, velcro for back of Woodsies (4 per camper)
* Important! MUST be the LOOP Velcro dots. The loop dots are the fuzzy ones.

Directions:
Sort all Woodsies for bug parts and wings. Sort shapes by pack type first, then by individual shape.

From the Assorted Packs
- Sort all large ovals into one pie pan
- Sort all large circles into one pie pan
- Sort all large teardrops into one pie pan

From the Jumbo Packs
- Sort all XXL circles into one pie pan
- Sort all XXL ovals into one pie pan
- Sort all teardrops (XXL and XL) into one pie pan
Put one loop Velcro dot (MUST be the loop dots!) on all of the following shapes and put them back in their individual pie pans

- XXL circles
- L circles
- XXL ovals
- L ovals

You should now have:

- 1 pie pan of L teardrops
- 1 pie pan of XXL and XL teardrops
- 1 pie pan of XXL circles with Velcro dots
- 1 pie pan of L circles with Velcro dots
- 1 pie pan of XXL ovals with Velcro dots
- 1 pie pan of L ovals with Velcro dots
Materials Preparation

Assemble wands (1 per camper):

- Attach 4 x 4" sticky back Velcro pieces to the center of 6 x 6" cardboard squares to create the wands’ paddles.
- Hot glue a jumbo craft stick to the back of the paddle, creating a handle.
- Note: The handle is not essential for Day 3, but it may be easier to prep everything at once.

Put the bug body pieces on the 4 x 4" Velcro squares on the wands (1 set of 4 per camper). Campers will use this to keep their pieces in place while printing.

All shapes should have already been sorted into individual pie pans and been given Velcro dots.

Each camper will need:

- 1 XXL circle (ladybug body)
- 1 L circle (insect head)
- 1 XXL oval (bumblebee body)
- 1 L oval (butterfly body)

Use scissors to cut 1 x 8" craft sticks in thirds for making bee markings (one 1 x 2.5" piece per 2 campers, reuse for all 3 rotations).

Cut 1.5 x 18" cardboard strips into 6 pieces for making bee markings (one 1.5 x 3" piece per 2 campers, reuse for all 3 rotations).

*Watch out, these cannot be much longer than 3", or they won’t fit in the 8 oz. deli containers!
Optional: If you want to include Velcro dots for bee wings today, cut some of the Velcro loop rolls into strips of 16-20 dots. Otherwise this can be added in for Day 4.

Setting Up the Space

Collect the Guided Activity materials. Make sure to keep these close by for quick distribution, but far enough away to not be distracting!
- bingo daubers – 1 set of red, blue, orange, yellow, purple, and green on a lunch tray (1 set per 4 campers)
- Velcro wands with set of 4 Woodsies attached (1 per camper)

Set up table groups for the Guided Activity/Independent Work Time:
- Insect Body Test Sheet (1 per camper)
- 16 oz. deli container (1 per 4 campers) filled with 4" dowels and Q-tips (1 each per camper)
- 16 oz. deli container (1 per 4 campers) filled with 1.5 x 3" cardboard strips and 1 x 2.5" craft sticks (1 each per 2 campers)
- 8 oz. deli containers (1 per 2 campers) to be filled with black tempera paint
- smocks at each seat

Gather materials for the Demo & Discussion:
- 1 set of materials from the Guided Activity
- 1 set of materials from Independent Work Time

Set up a Bee Wings Station as an Extension:
- Sharpies (1 per 4 campers)
- pie pan of L teardrops (2 per camper)
- Bee Wings color copy
- Optional: strips of Velcro loop dots (2 per camper)

Put up the following color copies on your copies display board:
- Insects
- Bees
- Ladybugs
- Butterflies

Morning Of Preparation

Pour paint into deli containers (2 tsp. per 2 campers). This is intentionally not a lot of paint.

Fill up the bucket with water for hand washing.
Notes

Materials Management
Go through the dowels, cardboard, Q-tips, and craft sticks after each rotation; if any are really messy, throw them away and replace them with new ones.

If you don’t have room for the Bee Wings Station on a separate table, you could lay out the materials on the floor after campers move to desks.

If you’re worried about campers losing their bee wings, put them right in their Stick Dice boxes, or blue tape them to their Velcro wands.

Pre-rip pieces of paper towel for campers to grab during clean up and to dry their hands.

Suggestions for Large Classes
Set up more than one Bee Wings Station.
Set out more than one bucket of water for hand washing.

Resupply Note For Days 3 & 4
If you need to resupply Woodsies, make sure you order them PER PACK, not per Woodsie.
• 1 pack of jumbo (teardrop, oval, circle) Woodsies has enough pieces for 3 campers.
• 1 pack of asst. shapes (circle, oval, teardrop) Woodsies has enough pieces for 9 campers.

On the Board

Mindset of the Day
BE REFLECTIVE – I take time to think about what is and isn’t working in my design.

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:
• Passing out bingo daubers and Velcro wands for Insect Bodies Guided Activity
• Writing names on Velcro wands
• Passing the Velcro wands back to campers when ready to print their final markings
• Help manage the bee wings station, reminding campers to take 2 teardrop Woodsies, use Sharpies, and consult the Bee Wings color copy for ideas
• Help you go through the dowels, Q-tips, cardboard strips, and craft sticks as campers clean up their workspaces; throw away and replace any of them that are really messy
Today: Symmetrical Butterfly Wings and Embellishments
Today campers create four symmetrical butterfly wings by covering Woodsies with tissue paper, sequins, and foam shapes. They also add embellishments to all parts and Velcro dots to their wings so they are ready to mix and match.
Today's Project: At-A-Glance

Find 2 sets of matching Woodsie wings

Matching XXL and XL Woodsies for butterfly wings

Cover both sets of Woodsies by gluing on tissue paper

Woodsies of the same size match each other in color, or all 4 can have the same color

Add Velcro dots to the backs of all 4 Woodsie wings

Velcro dots on the pointed ends of the wings, on the back side
Add symmetrical designs with sequins and foam shapes

Add embellishments to all insect parts and create bee wings

Symmetrical designs added with glue stick

Googly eyes added to insect head; bumblebee wings drawn with Sharpie marker
Teaching the Lesson: Overview

OUR SECRET SAUCE: THE G.I.A.

KNOWLEDGE FOCUS

CONCEPTS AND FACTS: Symmetry
Campers learn that symmetry means something is the same on both sides, and observe and discuss how butterfly wings are symmetrical.

Why? – Campers need to know and understand the concept of symmetry in order to create symmetrical designs themselves.

MINDSET FOCUS

BE REFLECTIVE – I take time to think about what is and isn’t working in my design.
Campers are careful to use matching materials and arrange them in matching designs, taking time to notice if their wings are symmetrical in size, shape, color and design.

Why? – Campers are often eager to make their projects as quickly as possible, without taking the time to think about what materials they are using and where. In order to make symmetrical wings, Nebulas are going to need to be very observant to notice if they are using matching materials and placing them in matching locations.

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 / Time</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Introduction</strong></td>
<td>5 min</td>
</tr>
<tr>
<td><strong>Guided Activity: Tissue Paper Butterfly Wings</strong> (20 min)</td>
<td>20 min</td>
</tr>
<tr>
<td>- Discuss symmetry in butterfly wings</td>
<td></td>
</tr>
<tr>
<td>- Demo finding 2 matching sets of teardrop Woodsies</td>
<td></td>
</tr>
<tr>
<td>- Demo covering the sets of wings with matching tissue paper colors and adding Velcro dots</td>
<td></td>
</tr>
<tr>
<td>- Facilitate covering 4 butterfly wing Woodsies with tissue paper and adding Velcro dots to the backs</td>
<td></td>
</tr>
<tr>
<td><strong>Demo &amp; Discussion: Symmetrical Design</strong> (10 min)</td>
<td>10 min</td>
</tr>
<tr>
<td>- Discuss symmetrical design</td>
<td></td>
</tr>
<tr>
<td>- Demo adding symmetrical designs to butterfly wings with sequins and foam shapes</td>
<td></td>
</tr>
<tr>
<td>- Discuss embellishments and review the bee wing creation station</td>
<td></td>
</tr>
<tr>
<td><strong>Independent Work Time: Finishing Wings and Adding Embellishments</strong> (15 min)</td>
<td>15 min</td>
</tr>
<tr>
<td>- Create symmetrical designs on 4 butterfly wings</td>
<td></td>
</tr>
<tr>
<td>- Add embellishments with googly eyes, glitter glue, and pipe cleaners</td>
<td></td>
</tr>
<tr>
<td>- If they haven’t already, make bee wings</td>
<td></td>
</tr>
<tr>
<td>- Get a Velcro wand and start mix-n-matching!</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>
<tr>
<td><strong>Transition</strong></td>
<td>5 min</td>
</tr>
</tbody>
</table>

### Timing Notes
Campers are on track so long as they have covered their butterfly wings with tissue paper and added Velcro dots to all insect parts.

If campers or groups are behind
- Campers don’t have to add all the embellishments.
- Campers don’t have to create bee wings.

If campers or groups are ahead
- Have campers decorate the cardboard borders of their Velcro wands with markers.
- Campers can make more wings at the bee wings station, or use extra Woodsies from the assorted and jumbo packs you were provided to build more bug parts – like parts of ants, beetles, grasshoppers, caterpillars, etc.
# Teaching the Lesson: Play-by-Play

## Introduction (5 min)

<table>
<thead>
<tr>
<th>Build excitement and give an overview of today’s project</th>
<th>Today they get to add more parts to their insects, and add Velcro to all their pieces so that they can actually mix-n-match! Hold up a Velcro wand with a finished mix-n-matched bug (ex: ladybug body + butterfly wings + insect head) as an example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tell campers they will spend most of today making beautiful matching butterfly wings</td>
<td></td>
</tr>
<tr>
<td>• Will work mostly on the floor together</td>
<td></td>
</tr>
<tr>
<td>• Will add embellishments at the end at table groups</td>
<td></td>
</tr>
</tbody>
</table>

★★ Introduce the Innovator’s Mindset: BE REFLECTIVE

<table>
<thead>
<tr>
<th>Point to this on your Innovator’s Mindset poster</th>
<th>Define the Mindset element in the context of today’s lesson</th>
</tr>
</thead>
<tbody>
<tr>
<td>Define the Mindset element in the context of today’s lesson</td>
<td></td>
</tr>
<tr>
<td>• <em>Today we’re going to focus on being reflective. This means taking the time to stop and think about our designs as we work. We will be trying to make our butterfly wings match each other, which is really hard to do if you’re not paying close attention to what you’re doing!</em></td>
<td></td>
</tr>
</tbody>
</table>

## Guided Activity

### Tissue Paper Butterfly Wings (20 min)

<table>
<thead>
<tr>
<th>Observe and discuss symmetry in butterfly wings</th>
<th>Explain that symmetry means that something is the same on both sides If we drew an imaginary line down the middle of a butterfly, would both sides look the same? (Yes!) Butterflies are symmetrical</th>
</tr>
</thead>
</table>

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Show Butterflies color copy

Have campers notice that the wings are exactly the same on both sides

Have campers share other things they notice about the butterfly wings
  • Colorful, lots of smaller shapes, interesting markings

Be sure to point out that there are really four wings; larger wings at the top and smaller wings at the bottom

Campers will also make 4 wings; 2 bigger and 2 smaller

★ Model BEING REFLECTIVE as you demo finding a matching set of larger and smaller Woodsie wings

Today we want to make sure our wings match in size, color, and design on both sides

Call out the opportunity to practice being reflective as you try to find a matching set of wings
  • Tops wings should be larger; bottom wings should be smaller
  • Top wings should be the same size on either side
  • Bottom wings should be the same size on either side

Search through a pie pan and pull out one XXL and one XL teardrop woodsie

Hold up the 2 teardrops in front of you and verbalize what you notice
  • Ex: Hmm, this wing looks slightly bigger than the other one. I guess that means it isn’t a match! I want to find a match for my bigger wing so it can be the top.
  • Pull out a new teardrop and compare it to the 2 you’ve already pulled out
• Keep searching until you’ve found a match for the big one; have campers help you notice if they are matching

• Say: Great! I found a match. Now let me find a match for my smaller wing.

Show that a good way to make sure the two Woodsies are exactly the same size is to put them on top of each other and notice if all the edges match

Discuss covering their wings in tissue paper to make them matching in color

Remind campers that the colors of a butterfly’s wings are also symmetrical; they are the same on both sides

They will cover their two sets of wings with colored tissue paper

Their goal is to make sure they match; same on both sides
  • All four wings can be the same color
  • Large wings can be the one color
  • Small wings can be a different color

Just like with their bugs yesterday, they will just choose a solid color for their wings for now

They will add other designs later that will give their butterfly wings more color

Star Model BEING REFLECTIVE and demo choosing colors and starting to cover the large wings with tissue paper

Campers have another chance to be reflective when adding matching tissue paper to their wings

Demo thinking about what color you want your butterfly wings
• Ex: *Hmm, I think I want my larger wings to be yellow and my smaller wings to be pink.*

Starting with the larger set of wings, demo using a glue stick to cover the entire side of one Woodsie

Select a piece of yellow tissue paper and place it on the Woodsie, rubbing gently to stick in on well

- May need two pieces for XXL Woodsies
- It’s OK if the edges of the tissue paper hang out over the edge of the Woodsie

Once covered, flip over the Woodsie and apply the glue stick to the edge of the reverse side, folding over any bits of tissue that overhang the edges

- If part of the tissue is still sticking up, just add more glue
- You can remind them to “glue and stick, glue and stick...” until all of the edges are stuck to the back side

★ Model BEING REFLECTIVE as you demo making sure your wing size and color matches as you keep working

Call out the opportunity to practice being reflective by making sure your next wing matches the size and color of the first one

Have campers help you practice being reflective with your next wing

- Pick up the smaller wing by accident
- Ask: *Is this the one I want to be yellow?* (No! You need the bigger one!)
- Find the other large wing
- Ask: *Okay, so I want this one to be pink, right?* (No! Yellow!)
Go through the motions of adding yellow tissue paper
Explain that they would repeat this process for their smaller wings

Tell campers that once they have finished covering their 4 butterfly wings, they will need to add Velcro stickers to the back so they can stick to their wands
They'll do this step on the floor too so you can be sure everyone has Velcro

Demo how to peel off Velcro, and where to place on the back of the Woodsie
  • Dots should be placed on the pointy ends (this will be closest to the body)

★ Support BEING REFLECTIVE

Have campers find a matching set of larger and smaller wings and cover them with tissue paper

➤ Have your TL help you pass out pie pans filled with XXL, XL, and L teardrop Woodsies
Remind campers to find their larger wings first
Since there are three different sizes of Woodsies, campers will have different size sets
Any combination is fine as long as they have a larger and a smaller pair
Keep an eye out for campers who are having a hard time matching
Remind campers to place Woodsies on top of each other as a way to check whether they are matching
➤ As campers find their matches, have your TL help pass out glue sticks and pie pans filled with tissue paper
Remind campers to double-check that their sizes match before doing a second wing
Give campers about 5 minutes for this step

Have campers add Velcro dots to the backs of their covered wings

➤ As campers finish adding tissue paper, have your TL help you pass out strips of 4 Velcro dots
Remind campers to put the Velcro on the pointy part of the wing
Give campers about 3 minutes for this step

Transition to the upcoming Demo & Discussion

Give campers a one-minute warning when they'll need to wrap up
They will have time to finish after they hear about the next steps

Have campers put their covered butterfly wings behind them so they won’t be distracted

Ask campers to flutter their hands like butterflies and then land those butterflies in their laps, where they get stuck in a little jar of honey

---

### Demo & Discussion

#### Symmetrical Design (10 min)

<table>
<thead>
<tr>
<th>Take a closer look at symmetrical designs on butterfly wings</th>
<th>Make sure campers have put their wings behind them and are keeping their hands in their laps, not distracted by their finished wings</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Symbol" /> TL can help watch for campers that get distracted by their wings, and remove wings from arms’ reach until the end of this discussion (if necessary)</td>
<td>Point to Butterflies color copy again</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /> Remind campers that as they noticed before, butterfly wings aren’t just one solid color</td>
<td>They have other designs which are symmetrical as well; for example:</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /> • Dots on the edge of the monarch’s wing</td>
<td>• “Eyes” on the edge of the red butterfly’s wing</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /> • Black lines that break the green butterfly’s wings into lines and shapes</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><img src="image" alt="Symbol" /> Hold up some foam shapes and sequins</th>
<th>Campers can use these materials to add symmetrical designs to their butterfly wings</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Symbol" /> Whatever they add to one wing, they should immediately add to the other wing of the same size, so that the 2 wings stay symmetrical!</td>
<td>Make mistakes as you demo and let campers correct you; for example:</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /> • Demo placing a random sequin on both of the larger wings</td>
<td>• Ex: <em>Hmm, I’ve put a sequin in the same place on both wings, but they don’t look the same. Does that mean my wings are still symmetrical?</em> (No!)</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /> • Oops! Okay, let me find a match for this sequin.</td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /> Suggest that campers always find a matching pair before putting anything on their wings</td>
<td>Be sure campers know they can combine the materials by putting sequins on top of foam shapes</td>
</tr>
</tbody>
</table>
Create a design using combined shapes (like the picture above) on one set of wings and have campers help you check if they are symmetrical in:

- size
- shape
- color
- placement

Once their butterfly wings are finished, campers can move to table groups

Bring their wings!

They can add embellishments to all of their insect parts

An adult will help them find their projects

Quickly go through all the materials available and where campers might use them on their bugs

Googly eyes
- Can use on head
- They are sticky back

Pipe cleaners
- Use as legs, antennae, stingers
- Will need to cut into smaller pieces with scissors
- Use glue dots

Glitter glue
- Can add to wings, bodies,
- Add last!
- Add a small amount with a Q-tip

Remind campers how to use glue dots
- Place glue dot where they want to put a pipe cleaner
- Scratch for 10 seconds before carefully peeling up the paper

Remind campers that a lot of other parts of bugs are symmetrical, like eyes and legs, so they should continue to take time and think about their designs while they are embellishing

Can make bee wings today, if didn’t yesterday

Review station materials: Woodsies, Sharpies, Bee Wings copy, Velcro dots
Just like their butterfly wings, if they make bee wings today, they need to add a Velcro dot to the back on the pointy end.

Bee wings are also symmetrical; they can make matching designs.

★ Review the next steps and what campers can do to practice BEING REFLECTIVE today

Just after this, campers will stay working on the floor to create symmetrical designs on their butterfly wings.

When they are finished, they can go to table groups to add embellishments to all their bug parts.

Review what campers can do to continue being reflective:

- Pay careful attention to make sure their butterfly wing designs are symmetrical.
- Create symmetrical embellishments on their other bug parts.
- Create symmetrical bee wings.

Independent Work Time

Finishing Wings and Adding Embellishments (15 min)

<table>
<thead>
<tr>
<th>What campers will do: Glue symmetrical designs on their wings and add embellishments to all their insect body parts</th>
<th>CREATE (on the ground)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Glue sequins and foam shapes onto butterfly wings in symmetrical designs.</td>
<td></td>
</tr>
<tr>
<td>CREATE (at the tables)</td>
<td></td>
</tr>
<tr>
<td>2. Use googly eyes, glitter glue, and pipe cleaners to add embellishments to all insect body parts.</td>
<td></td>
</tr>
<tr>
<td>3. Make bee wings with L teardrop Woodsies and Sharpies, if they haven’t already.</td>
<td></td>
</tr>
</tbody>
</table>

Extension
Decorate the cardboard border around the Velcro wand with markers.

Facilitate CREATE (on the ground)
Help campers who need assistance finding matching pairs of sequins and foam shapes.

Watch for campers who are using too much or not enough glue, and suggest making changes to the way they are using their glue sticks accordingly.

Have your TL help give campers their projects from yesterday when they are ready to move to table groups.

Facilitate CREATE (at the tables)
Make sure campers are not going overboard with the glitter glue.

➤ Make sure you or your TL are writing campers’ names on wand handles; names could also be prewritten before wands are set on tables.

Facilitate Extension
Campers who are done with their bug parts can add decorations to the cardboard border with markers.

Pass out markers.

★ Support BEING REFLECTIVE
Encourage campers to hold their wings up next to each other to make sure they are symmetrical, or to ask a neighbor to check their wings for symmetry.
Remind campers to look for opportunities to create symmetrical designs when they are adding embellishments.

Recognize reflective campers; be specific about how they are being reflective:
- Ex: I notice that you stopped and put your wings side by side so you could check and make sure they are symmetrical. Way to be reflective!
- Ex: Way to be reflective by finding matching pairs of sequins before gluing them on!

Ask guiding questions that support being reflective:
- How can you make sure your wings are symmetrical?
- What other symmetrical embellishments could you add?
- What can you do if you can’t find a matching _____?

Clean Up (5 min)

Clean Up

Have campers fit all their bug parts on the Velcro wand to keep them together:
- Doesn’t need to look like a bug, just needs to fit on there
- Help campers as needed

Make sure all materials are returned to their containers, glue sticks are recapped, dirty Q-tips are thrown away, and materials are picked up off the floor.

Reset and refill (as necessary) the tissue paper, glue sticks, Woodies, sequins, and foam shapes at front of class for the next rotation.

► Your TL can help you refill glue dot gardens as needed

Choose samples of campers’ butterfly wings that are symmetrical, and any cool embellishments (ways of using pipe cleaners, etc.) for Wrap Up.

Lesson Wrap Up (10 min)

★ Summarize the importance of BEING REFLECTIVE and have campers recall if/how they practiced this today

Recognize all the symmetrical designs and beautiful butterfly wings created today

Highlight effect of practicing Mindset during today’s project:
- Ex: One thing that helped us create so many beautiful and symmetrical butterfly wings today is that we used our powers of reflection to help us notice whether our designs matched or not.

Have campers flap their arms like butterfly wings if they practiced being reflective today by:
- Putting two materials on top of each other and noticing if the edges matched
- Holding up their wing Woodies side by side to see if they match
- Finding a matching foam piece or sequin before gluing them on
- Adding something else symmetrical to their insect parts other than butterfly wings (bee wings, legs, antennae, etc.)

If applicable recognize specific campers for exhibiting above behavior

Review why reflection is important for innovation:
- Ex: When you use your powers of reflection, you can make improvements as you work and create exactly what you’re imagining.
Get Ready!

Lesson Materials

* (starred) materials appear multiple times in this list

Copies
- copy, color, Butterflies (2 per classroom)
- copy, color, Bee Wings (2 per classroom)

General/Adhesives/Tools
- glue stick, washable, for collaging tissue paper (1 per camper)*
- pan, pie, aluminum, 9", for holding tissue paper squares (1 per 4 campers)*
- pan, pie, aluminum, 9", for holding butterfly wing Woodsies (1 per 4 campers)*
- pan, pie, aluminum, 9", for holding sequins and foam shapes (3 per 4 campers)*
- container, plastic, deli, 16 oz., for holding Velcro dots (1 per 4 campers)
- glue dots, 1/2", for attaching pipe cleaner embellishments (6 per camper)
- tray, lunch, for supplies (1 per 4 campers)
- scissors, medium, 5", pointed (1 per camper)
- scissors, easy-grip, mini, for campers struggling with cutting (1 per 4 campers)

Required Materials
Tissue paper butterfly wings
- paper, tissue, asst. colors, 12 x 18", for covering butterfly wings (four 2 x 3" pieces per camper)
- Woodsies, jumbo (teardrop, oval, circle), XXL and XL teardrops for butterfly wings (2 per camper)
- Woodsies, asst. shapes (teardrop, oval, circle), L teardrops for butterfly and bee wings (2 per camper)
- loop, 3/4" tape dot, black, adhesive back, Velcro for back of wings (4 per camper)

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.)

Embellishments
- sequin & spangle, asst. colors & sizes, for decorating butterfly wings (12 per camper)
- sequin, cup, 5 mm, asst. metallic colors, for decorating butterfly wings (12 per camper)
- foam shape, asst. sizes & colors, for decorating butterfly wings (10 per camper)
- pipe cleaner, asst. colors, 12", for embellishments (1 per camper)
- glue, glitter, asst. colors, 4 oz., set of 8, for embellishments (1 set per 8 campers)
- cup, plastic, 9 oz., for holding glitter glue (1 per 2 campers)
- Q-tip, double tip, 500 pk., for spreading glitter glue (1 per camper)
- googly eye, self stick, 10 mm, for embellishments (2 per camper)
- marker, washable, asst. color, set of 8, for extension – decorating wand border around Velcro (1 set per 4 campers)
- marker, Sharpie, fine pt., black, for drawing bee wings (1 per 4 campers)

Materials Preparation
Distribute all 3 sizes of teardrop Woodsies evenly into pie pans for wings (1 per 4 campers, plus 1 pie pan for bee station). You do not need to count out the Woodsies, just try to distribute them as evenly as you can. Teardrop Woodsies should have been sorted and returned to you with all L in one pie pan, and all XXL and XL in another pie pan.
Cut 12 x 18" tissue paper into roughly 2 x 3" pieces for covering butterfly wings (four 2 x 3" pieces per camper). Tip: it's easiest to cut several layers of tissue paper at once with the large paper cutter.

Distribute cut tissue paper into pie pans (1 pie pan per 4 campers).

Cut the Velcro loop dot roll into strips of 4 dots each for butterfly wings (1 set of 4 per camper).

Cut some of the Velcro loop dot roll into strips of 16-20 for the bee wing station. Campers can peel them off as needed.

Prepare 16-20 glue dots per 4 campers. Make sure to have a solution for campers to easily dispose of glue dot backing trash. If you've received glue dots in rolls prepare glue dot gardens with strips of 16-20 glue dots. (See Prep and Materials for the Summer for details.) If you've received glue dots in sheets just cut strips of 16-20 glue dots and place them in a container.

Place sequins and spangles, metallic sequins, and foam shapes in 3 separate pie pans (1 of each pan per 4 campers).

Setting Up the Space

Set the Guided Activity materials on the floor near where you will give instructions:

- pie pan of all 3 sizes of teardrop Woodsies (1 per 4 campers)
- pie pans filled with tissue paper pieces (1 per 4 campers)
- glue sticks (1 per camper)
- 16 oz. deli containers (1 per 4 campers) filled with Velcro dots (4 per camper)

Gather butterfly embellishment materials for easy distribution after the Demo & Discussion:

- pie pan (1 per 4 campers) filled with assorted sequins & spangles (12 per camper)
- pie pan (1 per 4 campers) filled with metallic sequins (12 per camper)
- pie pan (1 per 4 campers) filled with foam shapes (10 per camper)

Set the rest of the Independent Work Time materials at table groups on lunch trays:

- pipe cleaners (1 per camper)
- glue dot gardens, for attaching pipe cleaners (1 per 4 campers)
- googly eyes (2 per camper)
- 9 oz. cups, filled with glitter glue in the morning (1 per 2 campers)
- Q-tips, for spreading glitter glue (2 per cup)

Keep your bee wing station set up from Day 3:

- pie pan of teardrop Woodsies
- Sharpies, for drawing bee wings (1 per 4 campers)
- strips of Velcro dots, for the backs of bee wings (2 dots per camper)
- Bee Wings color copy

Gather materials for your demo during the Guided Activity and Demo & Discussion:

- Set of materials from Guided Activity: teardrop pie pan, a glue stick, 4 Velcro dots, and some tissue paper pieces
- Set of materials from Independent Work Time: sequins and foam shapes
- A set of embellishment materials: googly eyes, pipe cleaner, glitter glue and Q-tip, glue dots

Put up the following color copies on your copies display board:

- Butterflies
Morning Of Preparation

Pour glitter glue into 9 oz. cups with Q-tips for spreading.

Notes

Materials Management
Ideally, by the end of the day every camper’s bug parts will end up in their Stick Dice boxes from earlier this week for easy transportation home. It’s okay if some are still on the Velcro wands, as long as the wands have their names on them.

Suggestions for Large Classes
Set up more than one bee wing station.

Resupply Note For Days 3 & 4
If you need to resupply Woodsies, make sure you order them PER PACK, not per Woodsie.
• 1 pack of jumbo (teardrop, oval, circle) Woodsies has enough pieces for 3 campers
• 1 pack of asst. shapes (circle, oval, teardrop) Woodsies has enough pieces for 9 campers

On the Board

Mindset of the Day
BE REFLECTIVE – I take time to think about what is and isn’t working in my design.

➤ TL Help
There are a lot of things your TL can help with today, to make your lesson go much more smoothly. Write out some of the steps your TL can help with today on the board (see the below “Check In With Your TL” section), or just set out that section of the curriculum for him/her to read while you start the lesson.

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:

Guided Activity
• Distributing Woodsies, tissue paper, glue sticks, and Velcro dots to campers during the Guided Activity
• Collecting the Guided Activity materials so they don’t distract campers when they are done

Demo & Discussion
• Making sure campers’ wings are not distracting them during the Demo & Discussion

Independent Work Time
• Distributing sequins, foam shapes, and glue sticks to campers for Independent Work Time
• Handing out campers’ projects from Day 3 when they are ready for them
Day 5: Bubble Wands

Handmade bubble wands add an artistic spin to a classic toy enjoyed by generations of children. Today’s maker inspiration comes from Brian Lawrence and his Giant Soap Bubbles project.

Today campers create two bubble wands with patterned beaded handles and bent pipe cleaner loops.
Today’s Project: At-A-Glance

Bend pipe cleaner loops into different shapes on two wands

Examples of different loop shapes on bubble wands

Create bead patterns on the two wand handles

Examples of beaded patterns on wands, capped with a piece of duct tape to seal
Test wands at the bubble testing station

Blowing bubbles over the plastic bin
Teaching the Lesson: Overview

OUR SECRET SAUCE: THE G.I.A.

KNOWLEDGE FOCUS
CONCEPTS AND FACTS: Two- and Three-Unit patterns
Campers learn that two- and three-unit patterns are basic pattern types that apply to a wide range of elements.

Why? – Many campers may be familiar with patterns, but not know that certain types of patterns have names. Understanding this and being able to categorize a pattern will help Nebulas in the creation of their own patterns, as well as give them a foundation for recognizing two- and three-unit patterns in a variety of other situations.

PROCESS FOCUS
EVALUATE: Red Light, Green Light
During Independent Work Time, LIs will use “Red light!” announcements to have campers stop and check their beaded patterns. Nebs can correct their work if needed, and after giving a thumbs-up to show their patterns are correct, they can get a “Green light” to keep working.

Why? – It’s easy for Nebulas to lose focus and forget to think about what they are doing. In addition, Nebulas may not naturally stop and check their work. By giving campers random checkpoints, you’re providing a focused time to stop and check their work, to discover errors, and to correct mistakes as they go. By asking campers to give you a thumbs-up after they’ve checked themselves, you are supporting self-assessment and reflection.

MINDSET FOCUS
BE REFLECTIVE – I take time to think about what is and isn’t working in my design.
Campers work carefully to create shapes on their wands that work for making bubbles, and reflect on where and how they might modify the shape so it is most successful. When patterning, campers work slowly and carefully, taking time to stop and notice if they’ve made any mistakes.

Why? – However, it’s not likely that Nebulas will be reflective on their own, or know/understand specifically what to be reflective about. Supporting Nebulas in practicing thinking about their work will help cultivate reflective tendencies and help them end up with a final project they are extra proud of.

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: Wire Bending</strong></td>
<td>15 min</td>
</tr>
<tr>
<td>Demo using a closed and open shape to make bubbles</td>
<td></td>
</tr>
<tr>
<td>Demo bending curved and angular shapes</td>
<td></td>
</tr>
<tr>
<td>Facilitate bending loop shapes on two wands</td>
<td></td>
</tr>
<tr>
<td><strong>Demo &amp; Discussion: Patterning</strong></td>
<td>10 min</td>
</tr>
<tr>
<td>Define and discuss two-unit and three-unit bead patterns</td>
<td></td>
</tr>
<tr>
<td>Demo a two-unit and three-unit bead pattern on wands</td>
<td></td>
</tr>
<tr>
<td>Introduce Red Light/Green Light pattern checking</td>
<td></td>
</tr>
<tr>
<td>Demo testing bubble wands</td>
<td></td>
</tr>
<tr>
<td><strong>Independent Work Time: Beading Wands</strong></td>
<td>20 min</td>
</tr>
<tr>
<td>Create beaded patterns on bubble wands</td>
<td></td>
</tr>
<tr>
<td>Follow “Red Light, Green Light” pattern checks when prompted</td>
<td></td>
</tr>
<tr>
<td>Have an adult seal off the ends of the patterned wands with tape</td>
<td></td>
</tr>
<tr>
<td>When finished with both wands, test at the bubble testing station</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>
<tr>
<td><strong>Transition</strong></td>
<td>5 min</td>
</tr>
</tbody>
</table>

### Timing Notes

Campers are on track so long as they have bent two wand loops in two different types of shapes and have completed a bead pattern on at least one wand.

If campers or groups are behind:
- They can just focus on beading one wand.

If campers or groups are ahead:
- They can make a 3rd wand.
# 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>
</tbody>
</table>
| Build excitement and give an overview of today’s project                 | Build excitement by blowing bubbles with a sample wand with a simple, circular loop. We will create two of our own, beautiful, beaded bubble wands!  
  - First we’ll create different shapes for the loop using pipe cleaners  
  - Then we’ll design our handles by adding patterns with beads  
  - Finally we can test our wands at the testing station                                                                                               |
| ★ Introduce the Innovator’s Mindset: BE REFLECTIVE                       | 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 reflective. This means thinking carefully about the shapes we make for our loops and if they will work to make bubbles. We will also need to pay close attention as we create beaded patterns. We want to make sure that we make the same repeating pattern on the entire length of the wand. |
| Introduce campers to a maker who created his 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                                                                                             |
<p>|                                                                          | Have campers give a thumbs-up if they’re psyched to make their own toys like this maker!                                                                                           |</p>
<table>
<thead>
<tr>
<th>Guided Activity</th>
<th>Wire Bending (15 min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discuss the importance of creating an open shape loop on the wand</td>
<td>Making your own bubble wand means you can decide how it looks, but we also want to make sure it works. The loop at the end of the bubble wand is the part that makes bubbles. Call out that for successful bubbles, the shapes must be open in the center. • Allows for soap film to stretch across • Easier to blow air into open shapes</td>
</tr>
<tr>
<td>Demo dipping open and closed shape loops into bubble solution to show the difference</td>
<td>Demo difference between open and closed shape loops when trying to make bubbles. Use a sample wand with an nice open shape. • Dip the wand in the cup filled with solution • Remove the wand carefully and hold it upright • Blow bubbles over the bin Then, squish or scrunch up the pipe cleaner loop to make a more closed shape Demo dipping and blowing again, and notice how it’s harder to be successful with this kind of shape</td>
</tr>
<tr>
<td>★ Model BEING REFLECTIVE as you demo making curved shapes with pipe cleaners on a sample wand</td>
<td>We can bend our pipe cleaners into curvy shapes or angular shapes. Have campers share some ideas about shapes that are curvy. • (Circles, ovals, hearts, round flowers, etc.) Use a new sample wand to demo bending the pipe cleaner into a circle. • Use your pointer finger to “trace” the shape in the air above the loop • Use two hands, bend shape gently a little at a time, work slowly Demo being reflective by noticing if your shape has stayed nice and open Demo bending the circle into a heart shape. • Use your pointer finger to “trace” the shape in the air above the loop • Notice whether your shape is getting squished and small • Remind campers to use two hands, a little bit at a time</td>
</tr>
<tr>
<td>★ Model BEING REFLECTIVE and demo making angular/ zigzag shapes with pipe cleaners on a sample wand</td>
<td>Have campers share some ideas about shapes that have more angles or zigzags. • (Squares, stars, triangles, rectangles) Use the same sample wand to demo bending the pipe cleaner into a square. • Again use your pointer finger to trace the shape in the air above the loop • Use two hands; corners or sharp angles can be made with gentle pinching of the wire Demo being reflective by noticing if your shape stayed open Demo bending the square into a star shape that is too small and squished. • Have campers tell you whether they think the shape is open enough for bubbles (No!) • Ask them what you could do to make the shape bigger (Pull the edges of the pipe cleaner out a little bit, make the points on the star bigger, make fewer points)</td>
</tr>
</tbody>
</table>
### Have campers bend their pipe cleaner loops into different shapes on two wands

- Have your TL help you pass out two prepared wands to each camper
- Encourage campers to make a different shape on each wand
- Remind them to hold the wand up and visualize the shape they wish to bend by “tracing” it with a finger
- Remind campers to work slowly and bend and pinch gently
- Remind campers to notice whether their shapes are staying open
- Give campers about 4-5 minutes to bend their wands
- Check to make sure that the twist in the pipe cleaner at the base of the wand hasn’t been undone when campers bend their shapes

### ★ Support BEING REFLECTIVE

<table>
<thead>
<tr>
<th>Have campers notice whether both of their loop shapes are open enough for bubbles</th>
</tr>
</thead>
<tbody>
<tr>
<td>As campers finish up, ask some guiding questions to help them reflect on their work:</td>
</tr>
</tbody>
</table>
| - *Is the center of your shape nice and open?*
| - *How can you make your shape a little bit larger?*
| - *Does this look like a shape that can hold bubbles?*
| - *Is there enough room to blow a bubble?*

### Transition to the upcoming Demo & Discussion

- Give campers a warning that they will sit through one more demo before they can keep working on their own
- Have campers place their wands behind them on the floor so they aren’t distracted by them during the demo

### Demo & Discussion

#### Patterning (10 min)

<table>
<thead>
<tr>
<th>Define and discuss patterns</th>
</tr>
</thead>
<tbody>
<tr>
<td>A pattern is a repeated design</td>
</tr>
<tr>
<td>We can see patterns in art, clothing, decorations, jewelry, etc.</td>
</tr>
<tr>
<td>We will use patterns with beads to decorate the handles of our bubble wands to make them special and unique</td>
</tr>
<tr>
<td>Can make two different patterns on their wands using beads</td>
</tr>
<tr>
<td>Can choose the size and color</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Define a two-unit pattern and demo making a two-unit pattern on a wand</th>
</tr>
</thead>
<tbody>
<tr>
<td>A two-unit pattern means two different elements repeat over and over again</td>
</tr>
<tr>
<td>For example:</td>
</tr>
<tr>
<td>- Circle, square, circle, square, circle, square</td>
</tr>
<tr>
<td>- Red, blue, red, blue, red, blue</td>
</tr>
<tr>
<td>Let’s try making a two-unit pattern with the beads we have available here</td>
</tr>
<tr>
<td>- Have a camper select one bead (any size and color)</td>
</tr>
<tr>
<td>- Have another camper select another bead (any size and color)</td>
</tr>
<tr>
<td>Demo sliding the beads on the wand</td>
</tr>
<tr>
<td>Say your two elements out loud each time, have campers help you continue the pattern</td>
</tr>
<tr>
<td>- <em>Ex. Large red, small blue, large red, small blue, large</em>...</td>
</tr>
</tbody>
</table>
Define a three-unit pattern and demo making a three-unit pattern on a wand

A three-unit pattern means three different elements repeat over and over again

For example:
- Circle, square, triangle, circle, square, triangle, circle, square, triangle
- Red, blue, yellow, red, blue, yellow, red, blue, yellow

Let’s try making a three-unit pattern with the beads we have available here
- Have three different campers select three different beads (any size and color)

Demo sliding the beads on the wand

Say your three elements out loud each time, have campers help you continue the pattern
- Ex. Large blue, large pink, small green, large blue, large pink....

★ Support EVALUATE and model BEING REFLECTIVE as you demo and discuss “Red Light, Green Light” pattern checking

It’s easy to lose focus or forget what we’re doing when we’re working

Intentionally make a mistake on the 3-bead pattern and keep going
Explain that as they are working, you will call out “Red light!” from time to time to help them notice how it’s going.

This means stop everything, it’s time to check if the pattern is right.

Go slow to check the pattern:
- Point to each bead and say the pattern out loud; notice where you changed the pattern.
- Hooray! You caught your mistake!
- Fix the pattern by removing only the beads you need to in order to keep the pattern going (don’t need to take them all off).

When you think you’ve checked and corrected everything, you can give a thumbs-up.

When an adult gives you a “Green light,” you can start working carefully again.

When the pattern is finished, can raise their hands and an adult will help tape the end of the wand to seal it off.

Discuss testing their wands at the testing station:

When campers have completed their beading and gotten it taped up by an LI, they can visit the testing station to test their creations.

Show campers where the stations are.

Explain bubble testing rules:
- 4 campers at a station at one time (2 if your class is more difficult to manage).
• 2 campers on either end, sharing a cup of solution
• Be sure to blow bubbles over the bin, so the bubbles pop and land in the plastic

Campers may find that they need to adjust their pipe cleaner loops after testing
When finished, their wet bubble wands will go right into a plastic bag

Review the next steps
Will take their two wands and go to the table groups
Decide on a two- or three-unit pattern and start beading the first wand
Stop and check their work at “Red light!” call-outs

★ Review what campers can do to practice BEING REFLECTIVE today
Work slowly even during a Green Light
• LI may call out “No speeding!” and “Keep your eyes on the road!”
• Think about what bead comes next before putting it on
Check their patterns at Red Lights by touching each bead and saying the pattern out loud
Fixing their patterns if they find a mistake

Independent Work Time
Beading Wands (20 min)

What campers will do: Create patterns with beads on wands and test their wands

<table>
<thead>
<tr>
<th>CREATE</th>
<th>EVALUATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Select 2-3 beads to create the pattern on one of the bubble wands.&lt;br&gt;2. Slide the beads on the wand all the way to the end.&lt;br&gt;3. Repeat the pattern with the appropriate beads to fill the skewer, working slowly.</td>
<td>4. When the LI calls “Red light!” freeze and stop beading.&lt;br&gt;5. Check the pattern on the skewer for errors and correct any mistakes if needed.&lt;br&gt;6. Give a thumbs-up after the pattern is correct.&lt;br&gt;7. When given a “Green Light” from an adult, continue beading.</td>
</tr>
</tbody>
</table>

Facilitate CREATE
Help campers find the beads they want if they need support; they can check out other table groups for more of the colors/sizes they need
Facilitate **EVALUATE**

| Make sure campers are filling up the entire wand |
| ➤ Have your TL help with taping off the ends of the wands |
| **Facilitate TEST** |
| Call “Red light!” about 2-3 times per wand, based on average class pacing |
| At each “Red Light,” remind campers to check their patterns by pointing to each bead and saying the pattern out loud |
| Remind campers that they should give you a thumbs-up once they think the pattern is looking good |
| Give “Green Lights” on individual or small-group basis |
| You don’t have to individually check campers’ patterns, this is more just for campers to practice self-assessment |

**Support BEING REFLECTIVE**

| Recognize reflective campers; be specific about how they are being reflective |
| Ex: *Way to be reflective by catching that error and redoing the beads to make your pattern complete! OR I like how you’re working with focus to keep that pattern going!* |
| Call out traffic-themed reminders to help campers with their work |
| • Give out speeding tickets to campers who are rushing through their patterns |
| • Remind campers to “keep their eyes on the pattern,” just like they’d keep their eyes on the road while driving |
| Ask guiding questions that support being reflective: |
| • *How can you work differently so that you catch your mistakes earlier?* |
| • *Tell me about the pattern you are creating right now.* |
| • *What comes next in the pattern?* |

**Clean Up (5 min)**

| Make sure campers’ wands are in plastic bags with their names written on them with Sharpie |
| Place all beads back in bowls |
| Wipe up any soapy/drippy areas outside testing station bins |
Lesson Wrap Up (10 min)

| ★ Summarize the importance of BEING REFLECTIVE and have campers recall if/how they practiced this today | Recognize how careful campers were when working on their patterns  
- Ex: One thing that helped us be successful with our patterns was to work slowly and think about our patterns as we added each bead. When we were careful to create open shapes with our pipe cleaners, we had more successful bubbles, too!  
Have campers blow an imaginary bubble if they practiced being reflective today by:  
- Thinking about bending loop shapes with open space for bubble blowing  
- Thinking about “what comes next” before adding each bead  
- Catching a mistake and correcting it  
If applicable, recognize specific campers for exhibiting above behavior  
Review why reflection is important for innovation  
- Ex: When we are reflective, we are able to create projects that work and look great! |
| 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 his toy? How?  
If there’s a relevant Q&A read/revisit it now |
Get Ready!

Lesson Materials

Copies
- copy, color, Maker Connection (2 per classroom)

General/Adhesives/Tools
- marker, Sharpie, fine pt., black, for writing names on plastic bags (2 per classroom)
- towel, paper, roll, sheet, for wiping up soap drips (1 sheet per camper)
- container, plastic, deli, 16 oz., for bubble solution (2 per 4 campers)
- pan, pie, aluminum, 9", for distributing beads (1 per 4 campers)

Required Materials

Bubble wand loops
- skewer, wood, 10" (2 per camper)
- pipe cleaner, asst. colors, 12" (2 per camper)
- tape, duck, 1-7/8" wide, blue, for securing the loop (2" per camper)*

Pattern beading
- bead, pony, asst. colors (20 per camper)
- bead, pony, metallic asst. colors (20 per camper)
- bead, pony, jumbo asst. colors (40 per camper)
- tape, duck, 1-7/8" wide, blue, for securing the beads (1" per camper )*

Bubble testing
- bin, 41 qt, LWH 34-7/8 x 16-5/8 x 6-1/8" (1 per 4 campers)
- towel, dish (1 per 4 campers)
- soap, dish, liquid, 20-25 oz. (8 tsp. per 4 campers)
- bag, plastic, newspaper, 7.5 x 21", for wet bubble wands (1 per camper)

Materials Preparation

* Prep the bubble wands with pipe cleaners (2 per camper, you have been supplied with enough for extras which you can prepare now or as needed).
  - Attach the ends of the pipe cleaner to the pointed end of the skewer with a 1-inch piece of duct tape wrapped in a band. (Duct tape is more watertight than masking tape.)
IMPORTANT: Add a small twist at the base of the pipe cleaner so that it is a closed loop.

Cut roughly 0.5" pieces of duct tape to tape secure the ends of campers’ wands as they are done beading (two 0.5" pieces per camper).

**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**

Set the beading materials at each table:

- pie pan (1 per 4 campers) with a mix of:
  - pony beads
  - metallic pony beads
  - jumbo pony beads

Set up bubble testing stations (1 per 4 campers) with a 41 qt bin and two 16 oz. deli containers at opposite ends for soap solution (fill in the morning):
Choose a strategic location that will be out of the way and won’t be in the line of a lot of foot traffic to avoid slippery floors if bubbles pop outside the bin.

Set aside your Guided Activity building materials so they are ready to distribute to campers:
  • pre-prepped wands with pipe cleaner loops (2 per camper)

Gather materials for the Demo & Discussion:
  • 2-3 pre-prepped wands to demo blowing bubbles and bending pipe cleaners
  • testing station
  • pie pan full of beads (like on tables)

**Morning Of Preparation**

Mix bubble solution (1 deli container per 4 campers):
  • Add 8 tsp. dish soap to bottom of 16 oz. deli container
  • Add 8 oz. water (fill container halfway)
  • Stir gently to mix solution

Place containers of solution in the 41 qt plastic bins, one on either end.

**On the Board**

Mindset of the Day
BE REFLECTIVE – I take time to think about what is and isn’t working in my design.

**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:
  • During Work Time, circulate room watching for campers who need “Red Light” reminders
  • Add tape “caps” to ends of beads when complete
  • Help monitor the bubble testing station
  • Put wet bubble wands in plastic bags and write campers’ names