



Strand: Visual Arts  
Level: Grade 5/6  
Content: 45 minute broadcast + hands-on activity

## LIVE Arts: Art Meets Science

This session will allow students to participate in a live studio broadcast with guest artists Reilly Forbes and Carla Protsko. Students will be guided through a brief history of cinema, as well as creative activities that touch on themes of biology, optical illusions, and space exploration. Participants will create their own “thaumatrope”, a Victorian-era optical illusion toy. This broadcast will be presented in conjunction with the International Festival of Science, Technology, Engineering and Mathematics (STEMfest) being held in Saskatoon.

Please see page 3 for **Teacher Guided Post-Broadcast Activities**. These activities will give students the opportunity to apply what they have learned during the broadcast.

### About the Artists

**Reilly Forbes** holds a Bachelor of Fine Arts from the University of Regina and certification in Audio Engineering from the Ontario Institute of Audio Recording Technology. He has worked professionally as a sound designer and currently holds the position of Production Center Director at PAVED Arts in Saskatoon. Reilly has extensive experience working with youth in arts education, organizing and hosting workshops. Most recently, Reilly has worked with the Saskatoon Open Door Society and Core Neighbourhood Youth Co-op’s digital story telling project for First Nations and Canadian newcomer youth.

**Carla Protsko** holds a Bachelor of Science in Biochemistry and a Master of Science in Protein Crystallography from the University of Saskatchewan. She has worked extensively in medical, animal and chemistry research, and as a teaching assistant in undergraduate and graduate courses.

As a creative duo Reilly and Carla have produced several video and sound installation pieces that cross-sect their respective specialties. Most recently, they presented “Mu Arae” at the Mendel Art Gallery during LUGO. The project interpreted concepts of space travel, sound, and physics.

### Curriculum Aims & Goals

#### **Creative/Productive:**

Students will create a thaumatrope to explore the optical illusion of persistence of vision.

#### **Critical/Responsive:**

Students will be asked to identify and imagine ways that science and art can influence each other.

#### **Cultural/Historical:**

Students will learn about the history of cinema and how it evolved along with scientific advances. The artists will also discuss the relationship between art and science and how these two creative disciplines can inform one another.

### Broadcast Program (45 min)

#### **Materials and resources for broadcast:**

Students will need a pen or pencil and paper during the broadcast.

## **Artist Bio**

### **Presentation 1**

How are art and science connected?

### **Activity 1: Pair and Share**

With a partner, students will imagine a future technology that would help artists achieve something that is currently impossible.

### **Presentation 2**

A brief history of cinema and how science has influenced this art form.

### **Activity 2: Mini storyboard.**

### **Presentation 3**

What is Earth 2.0 and what kinds of organisms might live there?

### **Activity 3: Brainstorm**

Students will invent an organism that may exist on Earth 2.0.

**Demonstration:** How to make a thaumatrope.

## Curriculum Outcomes: [www.curriculum.gov.sk.ca](http://www.curriculum.gov.sk.ca)

### **CP5.7**

Create visual art works that express ideas about, and draw inspiration from, pop culture.

### **CP5.8**

Create art works using a variety of visual art concepts (e.g., positive space), forms (e.g., graphic design, photography), and media (e.g., mixed media, paint).

### **CH5.3**

Analyze and describe how arts and pop culture expressions convey information about the time and place in which they were created.

### **CP6.12**

Demonstrate increased skills and problem-solving abilities in a variety of visual art media.

### **CR6.3**

Examine arts expressions and artists of various times and places.

## **Teacher Guided Post-Broadcast Activities**

As a follow up to the broadcast, select one or more of the following activities to continue your students' learning.

Activity 1: Making Thaumatrope (45-60 minutes)

### **Option 1:**

Each student will make his or her own thaumatrope using the ideas generated during Activity 3 of the broadcast. Students should begin by reviewing and adding to the list of characteristics they wrote down. Once the list is complete, students should imagine what the organism would look like. Ask them to create a rough sketch. What is the organism's most interesting feature? Is it in a cage or a jar, or sitting on a tree branch or in a cave?

## **Materials/ resources**

Each student will need:

- The list of characteristics they came up with during the broadcast (Activity 3)
- 1 piece of 8.5 x 11 white paper (photocopy or printer paper works well)
- 1 piece of stiff cardboard at least 6 x 6 inches in size (bristol board or cardboard from a cereal box)
- a circular object for tracing (8-10 cm in diameter such as a mug or glass) or a protractor
- scissors
- glue stick
- pencil and eraser
- pencil crayons or markers (optional)
- two elastic bands
- access to a hole punch (these can be shared)

*Note: If you would like to make a pre-printed thaumatrope as a teaching aid, there is a great printable here:*

<http://blog.slurpystudios.com/history-of-animation/>

## Option 2:

Students will form groups of 2-3 and will create a set of thaumatropes that tell a story related to the ideas of Earth 2.0 and the creatures that might live there. They may all illustrate one organism doing several different things, or different organism that interact.

In this option, ask students to create a mini storyboard together, or write a loose outline of the story they want to tell. This will guide them as they create their thaumatropes.

## Activity

### 1. Trace and cut circles

Students may begin by tracing circles 8-10 cm in diameter on paper and cardboard. They will need two paper circles and one cardboard circle. Ask them to cut the circles out carefully so the shapes line up neatly.

### 2. Draw organisms

Referring to the rough sketch or storyboard sketches (Option 1 and Option 2 above), students should create illustrations on their paper circles. While students are drawing, remind them to think about how these images will combine optically when they put together their optical illusion toy.

\*\*\* **Important Note:** It is critical that students pay close attention to the spatial relationships of the two illustrations. For example, if the creature is on one side of the thaumatrope, the image on the other side should not be in the same spot unless this image is translucent. To review examples of thaumatropes that other students have made, try these links:

[https://www.youtube.com/watch?v=A\\_2TW5X4H6E](https://www.youtube.com/watch?v=A_2TW5X4H6E)

<https://www.youtube.com/watch?v=vypEOfWjzv8>

<https://www.youtube.com/watch?v=yOLE2OzoIYw>

\*TIP: To align the drawings, stack the paper circles and press hard with a pencil around the outline of the first image. The image impression will be on the 2nd circle and kids can easily align the images appropriately.

If you would like to make a pre-printed thaumatrope as a teaching aid, there is a great printable here: <http://blog.slurpystudios.com/history-of-animation/>

### 3. Share ideas!

While students are working on their illustrations, encourage them to walk about and see what others are working on. Share ideas!

### 4. Glue paper discs to cardboard

When students complete their illustrations, it's time to glue them to the cardboard. Remind students that the images must be oriented correctly to achieve the desired effect. Before

gluing, ask students hold their illustrations against their cardboard and rotate to get a preview of how it will look.

**6. Make holes and add elastic bands**

Use a hole punch to make two holes near the edge of the circles and on opposite sides from each-other. Try to place the holes along the axis of rotation. Thread an elastic band through one hole and tie a knot to hold the elastic in place. Repeat on the other side so that there is an elastic band in each hole.

**7. Try it out!**

While holding an elastic in each hand, rotate the disc until it is tightly wound. (Students can work in pairs for this, it can be tricky to do alone). Release the disc to see the thaumatrope in action!

**8. Make another or add colour!**

If time permits, encourage students to experiment making a second thaumatrope with an illustration of their choosing. Students may also add colour to their first or second thaumatrope for more striking visuals.

\*TIP: If students are running out of ideas for illustrations, they can also build word based thaumatropes.

**9. Show and Tell**

Have the students demonstrate their thaumatropes to the class. For students working in groups, ask them to share their stories during the performance.

Grade 6: Who would you be if you lived on Earth 2.0?

Ask students to write a paragraph describing how and if their identity would change if they lived on this new world.

**Activity 2 for Grade 5: Organisms meet Pop Culture Creatures (45-60 minutes)**

1. Ask students to explain what the “2.0” in “Earth 2.0” means. (The concept is often explained by using software as an example. When new versions of software are released they may use the same name but indicate an update by changing the numerical value following the name. So for example Java becomes Java 2.0 when a new version is released, then Java 3.0, etc.)

**Materials for Activity 2**

Each student will need:

- Several pieces of white paper (no lines) or template such as this one: <http://www.rodypolis.com/blog/storyboards-free-template>
- Pencil
- Eraser
- Optional: markers, coloured pencils or watercolour to add colour to their storyboard
- For examples of storyboards you can share with the class, see link at the end of #3.

2. Ask students to imagine that their imaginary Earth 2.0 organism meets a character from popular culture. Some questions to ask students may include;
  - How do the organism and pop culture figure communicate?
  - Are their similarities? Differences?
  - How would they interact?
  - Do you think there is popular culture (tv, comics, video games) on Earth 2.0?
3. Using these ideas, ask students to develop a short story about the organism's encounter with the Earth 1.0 pop culture character. Ask students to draw their story, using the storyboard format described by Reilly and Karla during the broadcast. Storyboards may be done in pencil or marker, adding colour is optional.

\*A storyboard template available here: <http://www.rodypolis.com/blog/storyboards-free-template>

\*There are also some examples of storyboards here; <https://passatdmt.wordpress.com/>

## Activity 2 for Grade 6: Is there an Earth 2.0 Version of You? (45 minutes)

1. Ask students to explain what the “2.0” in “Earth 2.0” means. (The concept is often explained by using software as an example. When new versions of software are released they may use the same name but indicate an update by changing the numerical value following the name. So for example Java becomes Java 2.0 when a new version is released, then Java 3.0, etc.)
2. Ask students to imagine that there is Earth 2.0 version of themselves. Have students write a list outlining at least three similarities and three differences between their Earth 1.0 (current) and Earth 2.0 identities.
3. Ask students to make a drawing of their Earth 2.0 self/ identity.

### Materials for Activity 2

Each student will need:  
 -Lined paper for writing and unlined paper for drawing  
 -Pencil and eraser  
 -Optional: markers, coloured pencils or paint to add colour

## Further Learning...

### 1. ROVER videos that relate to the broadcast content;

\*Note: Educators are advised to preview all video programs before using them in the classroom.

#### Levers and Pulleys

Series: The Science of Disney Imagineering

This video is hosted by a research and development "imagineer" for Disney theme parks who helps to design attractions. He presents an engaging look at how simple machines such as levers and pulleys were used to create attractions such as Dumbo the Flying Elephant and Soarin' Over California. Students will learn how levers and pulleys make work easier by either multiplying or redirecting the effort put into them. The narrator, through graphic animation, explains how levers distribute resistance and effort over a fulcrum.

## Magnetism

Series: The Science of Disney Imagineering

In this video, Walt Disney Imagineers demonstrate how they use magnets of all types throughout Disney's theme parks. From magnetic connectors that direct guests through attractions like The Seas with Nemo and Friends to playing back sound through audio speakers in Pirates of the Caribbean, Imagineers employ the forces of magnetism in a variety of ways. Students will learn about the attraction and repulsion of opposite poles, magnetic fields and domains, and electromagnets.

ROVER videos about animation:

### Animate Everything

This video program introduces basic animation to students through four short chapters. Using simple tools, students will learn how to transform everyday objects to create animated pieces. The two narrators, Lindsay and Will, demonstrate animation skills using everyday materials, such as twigs and rocks.

### Tying Your Own Shoes

Four budding artists with Down Syndrome express their thoughts regarding art, life, love and their experiences living with Down Syndrome. They express their frustrations, but also discuss their successes, dreams and satisfaction in being able to live independently. The program is animated in part using different techniques mastered by the featured artists including drawing, paint-on-glass, clay-on-glass, and paper cut-out animation.

ROVER stop motion animation example:

### A Mother's Earth

This award-winning series, produced in Cree, English and French, uses stop motion animation to portray life in a fictional northern Saskatchewan community. It focuses on issues and events in the lives of children and their supportive families in this traditional Cree community. The adults guide the children to retain their traditional culture and values while living in the modern world. In this episode, six year old Raven must write a report on identity, describing who she thinks she is. Through talking to many people in the community, 10 year old Talon reconciles her Cree-Metis identity as a daughter and sister. Cousin T-Bear and brother Talon are asked to help create a sweat lodge and through their hard work they earn their Indian names. Non-Aboriginal students viewing this film will gain a better understanding of Aboriginal identity and traditional practices. T-Bone's father's role at the band office provides a glimpse into First Nations governance and its complex issues. Educators are advised to preview all video programs before using them in the classroom.

## **2. Instructions to create more advanced optical illusion toys...**

### A. Phenakistoscope



<http://www.howcast.com/videos/148840-how-to-create-a-phenakistoscope/>  
template: [https://nellisipila.files.wordpress.com/2012/12/phenakistoscope\\_template.jpg](https://nellisipila.files.wordpress.com/2012/12/phenakistoscope_template.jpg)

B. Zoetrope

<http://www.howcast.com/videos/169724-how-to-create-a-zoetrope/>



C. Flip Book

<http://www.howcast.com/videos/1085-how-to-create-a-flip-book/>