

EXPLORING STEM THROUGH STUFFED ANIMALS

DEBORAH GOODMAN, SHALLOWFORD FALLS ELEMENTARY

Overview: During this ten-day STEM unit, students will engage in the following activities (see chart below) addressing ELA, mathematics, and science standards. Throughout the unit, students must use higher order thinking skills, work collaboratively, and apply knowledge about their stuffed animals to a variety of projects.

Science	Technology	Engineering	Math
<p>Students will:</p> <ul style="list-style-type: none"> • Sort animals in different ways, including their covering, habitat, number of legs, and the way they move. Students can also come up with their own ways to sort animals. • Graph the number of legs each animal has. • Use information about their stuffed animal's characteristics to create a "Can You Guess My Animal? Report." • Use information about their animal to create a model or drawing of a baby animal. • Compare and contrast their animal's characteristics with the characteristics of a friend's animal. 	<p>Students will:</p> <ul style="list-style-type: none"> • Utilize a digital camera to take pictures for their "Can You Guess My Animal? Report." 	<p>Students will:</p> <ul style="list-style-type: none"> • Collaborate with their partner to build a pen for two animals using a variety of materials, including blocks, Unifix® cubes, pipe cleaners or Popsicle sticks. 	<p>Students will:</p> <ul style="list-style-type: none"> • Graph the number of legs each animal has. • Use knowledge of 2-D shapes to build pens for their animals that are shaped like a circle, triangle, square, rectangle and hexagon.

Standards Addressed

1. **ELA.K.SL.1:** Participate in collaborative conversations with diverse partners about *kindergarten topics and texts* with peers and adults in small and larger groups.

2. **ELA.K.W.2:** Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which students name what they are writing about and supply some information about the topic.
3. **M.K.G.5:** Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.
4. **M.K.CC.4b:** Understand the relationship between numbers and quantities; connect counting to cardinality.
5. **M.K.CC.7:** Compare two numbers between 1 and 10 presented as written numerals.
6. **M.K.MD.3:** Classify objects into given categories; count the numbers of objects in each category and sort the categories by counting.
7. **SKL1:** Students will sort living organisms and non-living materials into groups by observable physical attributes.
8. **SKL2:** Students will compare the similarities and differences in groups of organisms.

Day One – Sorting Animals

Standards Addressed: 1, 7, 8

1. Teacher and students will discuss the question: *How would you go about sorting our animals today?*
2. Students will discuss how animals are similar and different, brainstorm ways that they can sort their animals, and decide how they will sort their animals. The teacher can work with students as a whole group, or divide students into small groups.
**You may need to guide some students towards different ways they can sort their animals . For example, students can sort their animals by how they move, how many legs they have, or the animal's habitat.*
3. Students will create sorting cards to demonstrate how they sorted their animals (e.g. zero legs, two legs, four legs or fly, run, walk, swim)
4. Place sorting cards on the rug to discuss and point out the various ways students sorted their animals.
5. Teacher will read the book *Whose Feet are These?* by Wayne Lynch, and ask questions about the book that encourage students to use higher-order thinking skills, for example:

Can you predict what animal the author is talking about? What other animals have...? How are the animals in the books similar or different?

Day Two – Graphing the Number of Legs Activity

Standards Addressed: 1, 4, 5, 6, 7, 8

1. Students will work with partners to sort their stuffed animals by number of legs.
2. Students will work in small groups to fill in **The Number of Legs on Our Stuffed Animals Have Graph** and answer the questions.
3. Small groups will discuss what they discovered from their graphs. Teacher will help guide small group discussions with higher-order thinking questions, for example: *Why do you think more animals have two legs than one leg? How do animals with two legs move differently than animals with no legs?*

Day Three and Four - Can You Guess My Animal? Project

Standards Addressed: 1, 2, 7, 8

1. Students will use information about their stuffed animal to create a report and riddle according to the following instructions:
 - Provide students construction paper and sentence strips with the following words. These sentences will go on the outside of the child's report.
It can _____. It has _____. It lives in _____. It has _____ legs.
 - On the inside, student will write: _____'s animal is a _____.

**During this activity, the teacher will conference with students as needed. Students can also use alphabet strips as a model for letter sound correspondence to differentiate for lower level readers and writers.*
2. Students will brainstorm answers to the following questions: *How can we put a picture in our report without drawing one? How will putting in a picture help our readers?*
3. Teacher will demonstrate how to use a digital camera and discuss with the students if they have ever used a camera before. Students will also discuss the following higher-order thinking questions: *How can this digital camera help us? Why is it a good tool for helping us? How can it be more helpful to us than just writing or drawing? In what ways is it more helpful than cutting and gluing pictures?*
** Students can also use other devices such as iPads or smart phones to take pictures.*
4. In pairs, students will discuss and decide on two rules for using the digital camera. Teacher will create a chart of these responses and the group will discuss rules for camera use.
5. Student partners will discover and take pictures of one another holding their stuffed animal.

6. Teacher will staple sentence strip cover page to the picture page so the picture will be hidden.
7. In pairs, students will read their riddles. Each student will try to predict what their partner's animal is by using the information in the report. At the end, students will lift the page to read and discover their partner's animal. Teacher will guide discussions between pairs with higher-order thinking questions, for example: *What clues helped you figure out your partner's animal? What did you read to make you think that? How did the digital picture help you complete your mental image?*

Day Five and Six – Comparing and Contrasting Animals

Standards Addressed: 1, 2, 7, 8

1. Students will tell their partners three important facts about their animal. (Informal Assessment)
2. Students will sit together and use their stuffed animals as models to draw their animals on the **Comparing and Contrasting Activity Sheet**. Then, they will discuss with their partners how their animals are the same or different.
3. Students will write on the **Comparing and Contrasting Activity Sheet** or dictate their responses to the teacher. (Formative Assessment)
4. As a whole group, students will use a “share chair” to share information with their peers. Their peers will also provide comments.

Day Seven and Eight – Baby Animals

Standards Addressed: 1, 8

1. Teacher will read Whose Baby is This? by Wayne Lynch and ask questions about the book that encourage students to use higher-order thinking skills, for example: *What do you think this baby animal is? Why do you think that? Explain your thinking. What is one important thing you remember that the author told us? Where in the text does the author tell us that? How does the author use pictures to support the story?*
2. Students will use factual information about their animal to create a picture or model of their animal with its baby. Students can use computers or books to research information about their baby animals.
3. Students will create their final picture or model with their choice of medium (water colors, markers, clay, puppet, etc.).

4. Students will share their final project with the class, including the name of both the mother and baby animal. Throughout these presentations, teacher will guide the discussion using higher-order thinking questions (e.g. *What do we know about the size of the parents and their babies? How is the baby animal similar to the parent? How is it different?*)

Day Nine – Engineering Day

Standards Addressed: 1, 3, 8

1. Teacher will read *Shapes, Shapes, Shapes* by Tana Hoban and ask questions about the book that encourage students to use higher-order thinking skills, for example: *Why do you think the illustrator chose to use photographs instead of drawings? How did Tana Hoban’s use of the digital camera help her readers?*
2. Teacher will review the following 2-D shapes: circle, rectangle, square, triangle, hexagon. Teacher will guide discussion using higher-order thinking question, for example: *With a partner, compare and contrast two shapes. Describe something in the real world that is shaped like a circle, a square, etc.*
3. Student partners will engineer and build a pen for their two stuffed animals using **Differentiated Task Cards**. Students may choose to build their pens using a variety of materials, including Unifix® cubes, pipe cleaners, Popsicle sticks, paper clips, play dough, etc.
4. Students and teachers will debrief about the successes and challenges they had while building pens for their animals.

Day Ten - Summative Assessment

Standards addressed 7, 8

1. Students will complete an **Animal Sorting Activity** on the computer or on paper. Students will:
 - Decide two ways to sort the animals (be sure to remind them they do not need to use all of the animals),
 - Label the ways they sorted the animals, and
 - Explain in at least one sentence how they sorted their animals.
2. Teacher will use the **Formative Assessment Grading Rubric** to assess students’ progress.