

Mathematics: The Language of STEM

Goldilocks and the Three Bears Math

Gina Courtois - Lesson 1

CONTENT AND TASK DECISIONS

Grade Level(s): Kindergarten

Description of the Task: Students will understand that objects can be sorted by different attributes. Students will then justify their reasoning for sorting objects by attributes using appropriate math tools.

Indiana Mathematics Content Standards:

K.DA.1: Identify, sort, and classify objects by size, number, and other attributes.

K.M.1: Make direct comparisons of the length, capacity, weight, and temperature of objects, and recognize which object is shorter, longer, taller, lighter, heavier, warmer, cooler, or holds more.

Indiana Mathematics Process Standards:

PS.1: Make sense of problems and persevere in solving them. Students will sort the teddy bears according to an attribute that they decide upon working together with their partner.

PS.4: Model with mathematics. Students will use teddy bears and sort by attributes that they determine. Students will share their groups and explain why they chose to sort the bears the way they did.

PS.5: Use appropriate tools strategically. Students will have the opportunity to use scales or sorting trays to sort the bears by their identified attribute.

Mathematics Content Goals:

Students will learn how to sort by different attributes and explain their reasoning. Students will use appropriate math tools (teddy bears, scales, sorting trays and mats) to justify their sort.

Language Objectives:

Speaking - Students will explain their reasoning for sorting their bears by using manipulatives and math tools (scales and sorting trays) to prove their answers. Students will share their sorting using their iPads and sharing the pictures that they captured.

Materials: Teddy Bears (3 different sizes), scales and sorting trays and sorting mats, iPads

THE LESSON

Before:

- **Activate prior knowledge** (including the specific questions you will ask to raise students' curiosity and activate or determine their prior knowledge), The students will listen to the story Goldilocks and the Three Bears. This will give all students the same background knowledge. The students will then be given a container of teddy bears with various sizes and colors. This will be the first time the students have seen and used the teddy bears so they will have 5 minutes of discovery time with the bears.
- **Be sure the problem is understood:** Explain to the students that they will have a limited amount of time to work with their partner. While working with their partner they will need to decide how they want to group the bears and any tools that they might need (sorting trays and mats, scales) to determine their groups.
- **Establish clear expectations :** Today we will be using this container of bears. The bears need to be grouped and working with your partner you will decide how you will group these bears. Once you determine how you will group the bears you will then need to be able to share how you did this and why. Once we are done working with the bears we will be putting them all back into the containers. If you choose to use a scale, sorting mats, or trays you will need to put them back as well.

During:

Students will be given a container of bears that are various sizes and colors. Students will be given limited directions but will have scales, sorting trays and sorting mats available if they choose to use them. The directions to the students will be as follows: "I have this container of bears and they make me think of the story that we just read. I wonder how you can make connections with the story and group these bears. After you and your partner decide how you are grouping you must explain your thinking Use your iPad to capture the grouping that you and your partner created.

- **Let go:** Circulate around the room and make sure students are working with partners and grouping their bears, following the given directions and expectations.
- **Listen Actively:** When prompting students and asking questions be sure to only encourage their ideas and not give them ways to group or tools to use. Their ideas need to be praised and free choice of tools needs to be allowed.
- **Provide Appropriate Support:** Ask students any of the following questions as they are working:
 - Are you working with your partner and listening to his/her ideas?
 - Can you explain why you grouped your bears the way you did?
 - What tools have you and your partner chose to use?
 - Have you taken pictures with your iPad to capture the groups that you and your partner created?
- **Provide Worthwhile Extensions:** If students finish early they can weigh teddy bears and record their answers:
 - How many small teddy bears does it take to weigh the same as a large teddy bear?
 - How many small teddy bears does it take to weigh the same as a medium teddy bear?
 - How many medium teddy bears does it take to weigh the same as a large teddy bear?

After: Students will gather together and share their thinking. Students will explain their grouping/sorting and share how they decided the bears should be sorted. New ideas will be celebrated,

questions to prompt higher level thinking will be asked, students ideas will be recorded on chart paper so that we can refer back to their ideas. Students will share their grouping and learning by sharing the pictures that they took with their iPads.

- **Promote a mathematical community of learners:** Discuss the various ways students grouped their bears. Celebrate the different ideas and ways that the students used the math tools to help them group the bears.
- **Listen actively without evaluation:** While students are sharing their ideas ask questions that promote more thinking - Why did you decide to use the scale? How did it help you to make your groups? As students share what worked and what didn't ask questions that lead them to solve their own problems - don't solve it for them - What would you do different next time? How do you think that could help you?
- **Make connections:** The following questions can be asked:
 - What did you notice about the way other students grouped their bears?
 - Did you notice ways that you would try next time?
 - Can you do the same with other manipulatives in our room?
- **Summarize main ideas:** Discuss what we have learned about grouping the bears by different attributes. Review the different ways the students used the scales, mats, and trays to help in the sorting.

ASSESSMENT: Observe students working with their partner to determine if they are grouping bears according to attributes. If they are a student with an IEP they need to be prompted to use a tool (scale, workmat, trays). This lesson was designed for students to become more familiar with sorting and comparing by weight. Assessment will be based on students grouping and using materials appropriately, working with a partner and following directions and their explanation.

Observe: Students will be working with partners to decide how to group the bears with different attributes. The students will be encouraged to discuss their reasoning for grouping their bears. If the students decide to use tools questions will also be asked to understand their thinking. Participation by all students will be required. Students will capture their grouping and learning with their iPads by taking pictures.

Ask:

Why did you decide to group the bears in that way?

How did you decide to use that tool to help your grouping?

What problems did you encounter?

Did you and your partner agree during this process - how did you work together?

Would you do anything different next time?

What did you enjoy most about this activity?

Weighing and Comparing Teddy Bears
Extension Activity

1. How many small teddy bears equal a large teddy bear?



2. How many medium teddy bears equal a large teddy bear?



3. How many small teddy bears equal a medium teddy bear?

