# Constructing Task: Snails and Lizards

(Approximately 2-3 Days)

## STANDARDS FOR MATHEMATICAL CONTENT

**MCC2.MD.1** Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.

**MCC2.MD.2** Measure the length of an object twice, using length units of different lengths for the two measurements

**MCC2.MD.3** Estimate lengths using units of inches, feet, centimeters, and meters.

**MCC.2.MD.4** Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.

## STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

*****Mathematical Practices 1 and 6 should be evident in EVERY lesson. *****

## BACKGROUND KNOWLEDGE

(Information adapted from Mathematics Common Core State Standards and Model Curriculum, Ohio Department of Education Teaching)

Students should have experience measuring the length of the same object using different tools (ruler with inches, ruler with centimeters, a yardstick, or meter stick). This will help students learn which tool is more appropriate for measuring a given object. They describe the relationship between the size of the measurement unit and the number of units needed to measure something. For instance, a student might say, “The longer the unit, the fewer I need.”

Estimation helps develop familiarity with the specific unit of measure being used. To measure the length of a shoe, knowledge of an inch or a centimeter is important so that one can approximate the length in inches or centimeters. Students should begin practicing estimation with items which are familiar to them (length of desk, pencil, favorite book, etc.).

Some useful benchmarks for measurement are:

- First joint to the tip of a thumb is about an inch
- Length from your elbow to your wrist is about a foot
- If your arm is held out perpendicular to your body, the length from your nose to the tip of your fingers is about a yard

## ESSENTIAL QUESTIONS

- How can we decide on appropriate units of measurement (i.e. inch, foot, yard)?
- Why is it important for us to know how to measure different units of measurement?
- How do I know if an estimate is reasonable?
- Why do we need to be able to estimate a measurement or value?

## MATERIALS

- *Twelve Snails to One Lizard* by Susan Highower or similar book
- Class set of twelve-inch rulers
- 6-8 yard sticks
- Ribbon for making snakes, iguanas, and snails (it is recommended to not use yarn as it stretches and can complicate the lesson as the students measure items)

## GROUPING

Large Group, Small Groups

## TASK DESCRIPTION, DEVELOPMENT AND DISCUSSION

**Part I**
Read *Twelve Snails to One Lizard* by Susan Hightower or similar book to the class. Have the children measure items such as the ones in the story using a nonstandard type of measurement unit like the student's feet. For example, have everyone measure the length of the classroom using their feet (or review from prior tasks where this was discussed). Ask questions such as "Did all of you get the same measurement? Why or why not? Can you explain why this happened? Is there a way to measure our classroom and not get so many difference answers? Is there a tool we can use besides our own feet?" At this point, you would want to refer back to the previous task, *My Big Foot.* Discuss the story and identify the problem and solution.

**Part II**
Students measure the distance across the room and record their measurements. They will hopefully ask which measurement to use for this distance. Invite student discussion on the appropriate unit (foot and yard) to use and why. Help to guide the discussion of why inch would not be the best unit for this measurement. After measurements are completed, groups will share

their findings. Let students discuss/argue rationale for foot and yard as better choices for measurement of the classroom.

**Part III**
Use ribbon to make snakes that are exactly thirty six inches long (one yard), iguanas that are twelve inches long (1 foot) and snails that are exactly one inch long. Teacher should make yard sticks available or have a measuring table where students could use pre-marked place on table to measure and cut their ribbon. The group will create one of each animal and explain the relationship of the three. This may be done through a journaling activity or chart that the group creates. The teacher should be sure to provide conversations about the standard measurement vocabulary of inch, foot and yard.

**Please note**: Encourage the groups to show how many snails it takes to equal one snake to avoid inaccurate measurements.

Students should answer questions (using math journal) such as:

- Which is the smallest unit of measurement? Largest?
- How many snails does it take to equal the length of an iguana? How many iguanas does it take to equal the length of a snake?

**Part IV**
(This portion should be done on the next day to allow the student to fully comprehend the unit comparisons)

As a class, generate a list of items that the students think are one inch, one foot and one yard in length. Then give each student a twelve inch ruler and divide class into groups of three students. Students should locate an item that is approximately one inch long, an item that is one foot long and an item that is one yard long. (All three students must work together to measure a yard by putting their three twelve inch rulers together). Then have students find items that are shorter and/or longer than one inch, one foot, and one yard. Bring students back together and discuss the items they located in these measurements. Facilitate discussion on comparisons of the items and their measurements.

**Part V**
Students should choose one item that is longer than their snake or 1 yard. Measure the object and record the measurements. The measurements should be done to nearest whole unit. At this point students are not using fractional notation so they should only be using whole units, however, this does not mean that discussion of fractional parts should be prohibited. Descriptions should include at least 2 ways to record the measurement. For example: yards and inches, feet and inches, or all inches.

**FORMATIVE ASSESSMENT QUESTIONS**

- Did all of you get the same measurement? Why or why not?
- Can you explain why this happened?

- Is there a way to measure our classroom and not get so many difference answers?
- Is there a tool we can use besides our own feet?
- How do we determine the smallest unit of measure? How do you know?

## DIFFERENTIATION

### Extension

- Have students measure other items and make comparisons. Write about the comparisons in their math journal using comparison symbols >, <, =.

### Intervention

- Provide students with a piece of adding machine tape that is one inch, one foot, and one yard, so they can visually see the difference in each unit of measurement. Then have them use the inch piece to determine how many inches it takes to make a foot. Do the same for how many feet are in a yard. By using adding machine tape, students can see the measurements more clearly. They may choose to mark it on the paper in different colors or cut the paper.

Name_____

# Snakes and Lizards

| Measurement | 1 inch | 1 foot | 1 yard |
|---|---|---|---|
| Approximately | | | |
| | | | |
| Longer | | | |
| | | | |
| Shorter | | | |
| | | | |