

Flip the Beans

Summary

Students will use beans and/or bean bags to practice their estimation and measurement skills. They will be able to measure distances to the nearest inch or foot.

Main Core Tie

Mathematics Grade 2

[Strand: MEASUREMENT AND DATA \(2.MD\) Standard 2.MD.1](#)

Additional Core Ties

Mathematics Grade 2

[Strand: MEASUREMENT AND DATA \(2.MD\) Standard 2.MD.3](#)

Mathematics Grade 2

[Strand: MEASUREMENT AND DATA \(2.MD\) Standard 2.MD.4](#)

Materials

- [Bean Flip](#)
Measurement items
- *Jim and the Beanstalk*
Math Journals
Plastic bean counters
12 inch rulers
Ziploc bag of coins
Small items: paper clips, birthday candles, tongue depressors, etc.

Additional Resources

Books

Jim and the Beanstalk, by Raymond Briggs; ISBN-13:9780698115774

Background for Teachers

Students will use beans and/or bean bags to practice their estimation and measurement skills. They will be able to measure distances to the nearest inch or foot.

Review the following vocabulary with students:

- Length -- a measured distance of an object
- Distance -- amount of separation between two points
- Estimate -- a guess or judgment based on observations.

Intended Learning Outcomes

1. Demonstrate a positive learning attitude.
2. Develop social skills and ethical responsibility.

Instructional Procedures

Invitation to Learn

Have each student select a Ziploc bag from a basket. Each bag should contain approximately \$1.50-\$2.00 in coins as well as a small item. [Example: a paper clip, a birthday candle, a tongue depressor, etc.] Ask the students to measure the height of their desk from the floor to the top of their desk using the item inside their bag. They must now pay \$0.05 for each measurement length if they want to use

their desk for the remainder of the class period. Have students trade items with other students and measure using the various nonstandard items. Students will recognize that the smaller the unit, the more iterations needed to cover a given length. Have students record their findings in their Math Journals. Review with students that sometimes we use nonstandard units of measurement.

Instructional Procedures

Read *Jim and the Beanstalk* to the class. Discuss how Jim measures the different body parts and items in the book. Refer to the proportions of what is being measured and what unit of measurement is used.

Hand each child a bean counter.

Explain to students that they will be flipping a bean at their desks. They will be recording estimates as well as actual measurements.

Demonstrate how to flip a bean across a desktop without it leaving that space. The beans must stay on the desktop for this activity.

Hand out the *Bean Flip* recording sheets and explain how to record the data. Review with your students the length of an inch before you ask them to make their estimates.

Students will complete 10 trials with their beans. Students should flip their bean, make an observation and record their estimate as to how far the bean traveled on their desk. Then students will use a ruler to measure the actual distance and record it on their sheets. Students can see how close their estimates were by finding the difference between the two measurements.

See Group Activity under Curriculum Extensions

Extensions

Curriculum Extensions/Adaptations/ Integration

Group Activity: After students have completed 10 trials with the beans, the class can work together in the gym, outside, or in an open classroom tossing a bean bag. This will give the students an opportunity to estimate and measure longer distances. It can be done in relay fashion with a starting point and an ending point. Each team should be equipped with a bean bag, clipboard, pencil, recording sheet, and a standard unit of measurement (yardstick/measuring tape). At the signal, each team gently tosses the beanbag underhand. Students should make an observation, record an estimate, and then work together to measure the actual distance. The first group that gets from start to finish with the closest measurement to the correct answer would win that round.

By making relay teams, students who do not understand or have other special needs can still participate and have a successful learning experience.

Students can plant bean seeds. Using a ruler they can record in their Math Journals the plants' growth pattern.

Family Connections

Have students take home a dried bean and a recording sheet. They could challenge members of their family to flick the bean only a certain distance, making sure to measure and record the data. Encourage students to teach the relay game to their families and play it at home.

Assessment Plan

Ask students to move their bean about ____ inches to see if they comprehend how long one inch is.

Collect students' recording sheets to determine if students have used appropriate units of measurement.

Have students record in their Math Journal five different items with their measurement recorded in beans as well as inches.

Bibliography

Research Basis

Battista, M. (1994). Teacher Beliefs and the Reform Movement in Mathematics Education. *Phi Delta Kappan*. 75(6) 462-470.

Recent efforts to make the mathematics curriculum consistent with the National Council of Teachers of Mathematics "Standards" will fail unless teachers' beliefs about mathematics change. Teacher educators, school officials, political leaders, and teachers themselves must first acknowledge a serious problem with the way our society views mathematics. The next step is reforming the institutions affecting teachers' education and working environment.

McClain, K., Cobb, P., Gravemeijer, K., and Estes, B. (1999). Developing Mathematical Reasoning Within the Context of Measurement. In Stiff, V. and Curcio, R. (Eds.) *Developing Mathematical Reasoning in Grades K-12, 1999 Yearbook*. (93-106). Reston, VA: National Council of Teachers of Mathematics.

This paper describes how one group of students developed personally meaningful ways to reason mathematically within the context of measurement. Episodes taken from a first grade classroom in which a 4-month teaching experiment was conducted are presented. One of the goals of the teaching experiment was to develop instructional sequences designed to support first grade students' construction of meaningful understandings for measurement and mental computation and estimation strategies for numbers up to 100. A primary focus when developing the instructional sequences was to support students' multiple interpretations of problem situations. The episodes provide a setting for the examination of measurement as a context for supporting students' construction of sophisticated ways to think and reason mathematically. The intent of the instructional sequences developed in the course of the teaching experiment is outlined first. The rest of the paper consists of descriptions of episodes from the classroom that highlight students' ability to reason mathematically while investigating issues related to measurement.

Authors

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