

# Pennies for Pits

## Summary

Students will use fruit to learn about portions and percentages.

## Main Core Tie

Mathematics Grade 6

[Strand: RATIOS AND PROPORTIONAL RELATIONSHIPS \(6.RP\)](#)

## Materials

Balance scale

Triple beam scale

Digital scale

Fruit

- [Let's Get Weighing worksheet](#)

## Additional Resources

### Book

- *Bottle Biology: An Idea Book for Exploring the World Through Soda Bottles and Other Recyclable Materials*  
, by Mrill Ingram; ISBN 084038601X

## Background for Teachers

Teachers need to determine the level of each student's ability to determine percentages. This lesson is based on the assumption that the students have a working knowledge of mathematics involving percent.

The fruit experiment shows students that measurement is always an approximation. Weighing the edible portion and the nonedible portion separately may not provide the same weight measurement as when the fruit is weighed as a whole.

## Intended Learning Outcomes

2. Become mathematical problem solvers.
3. Reason mathematically.
4. Communicate mathematically.
6. Represent mathematical situations.

## Instructional Procedures

### Invitation to Learn

Each student needs a piece of fresh fruit. You may want to have them bring their own fruit from home. Ask them to predict what percentage of their fruit is edible and what percent is not. Observe what fruit other students have and make a prediction about which fruit will have the highest and lowest percentages of edible portions. Which have similar percentages of nonedible and edible portions?

### Instructional Procedures

Ask the students the following four true or false questions. They are to answer with a thumbs up (yes) or thumbs down (no). No sideways thumbs allowed.

Do bananas grow on trees? (no)

Are cucumbers fruit? (yes)

Is the pit of a peach good for you to eat? (no)

Are apples and roses in the same family? (yes)

Describe the parts of the fruit to the class. Students weigh the whole fruit using different types of scales, then record their findings. Weigh each of the fruits on the three scales and take an average of the weight. Record the weights on the [Let's Get to Weighing worksheets](#). Cut the fruit, removing the portion that is not edible and weigh it against the edible part for comparison. Each portion is weighed three times and the three weights are averaged.

Have each group share their data and findings. Provide the first three columns of information to the rest of the class. The class can fill in the fourth column using their own computations.

### Extensions

Do this activity along with microorganisms in science. The nonedible portions of the fruits can be added to your decomposition chambers. Information on decomposition chambers is found in *Bottle Biology*.

### Family Connections

Have students find four to six fruits or vegetables at home and estimate what portion of each is edible or nonedible. If possible, students weigh the whole item and its separate parts using a scale from home or checked out from the teacher. Look for other household items made up of parts and weigh or measure the various parts (e.g., The kitchen chair is 40" tall--of that height, 50% legs, 5% seat, and 45% back.).

### Assessment Plan

Review completed *Let's Get Weighing* worksheets for correct computations and consistent measurements.

Formal assessment should be done at end of measurement unit.

### Bibliography

#### Research Basis

Thompson, P.W. & Lambdin, D. (1994). Research into practice: concrete materials and teaching for mathematical understanding. *Arithmetic Teacher*. 41(9), 556-558. ERIC EJ491834.

This article discusses the role of concrete materials in teaching for understanding. It includes research on the use of concrete materials, seeing mathematical ideas found in them, and identifying what teachers want students to understand.

Hartshorn, R. & Boren, S. (1990). Experiential Learning of Mathematics: Using Manipulatives. *ERIC Clearinghouse on Rural Education and Small Schools*. Charleston, WV. ERIC ED321967.

This article highlights much of the research on experiential learning in mathematics including the development and implementation of manipulatives in math instruction. It also addresses adherence to national math standards and directions for future research.

### Authors

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