

Math Lesson: Estimation Station

Materials Needed:

- Rotating Carousel Organizers (DEF3901CR)
- And/or Stackable Caddy Organizers (DEF29003)
- Wet Erase Markers (assorted colors DEFSMA510-V4 & white DEFSMA510-V4-WT)
- Magnetic Customizable Sheets precut into 4" x 3" squares (DEF5901)
- Classic Image® Sign Holder (DEF68201, DEF69201)
- Variety of objects to put in canisters for estimation (Examples: candies, craft balls, interlocking blocks, marshmallows, paperclips, large seeds, beans, macaroni pasta, buttons, crayons, play money, rice, etc.)

Grade Level

☒ Pre-K - 3rd Grade

LEARNING OBJECTIVE

At the end of this lesson students will demonstrate understanding of number sense and reasonableness of estimates for objects by comparing, contrasting, classifying and counting. Older students will apply mental math computation relative to the numbers 10 and 100 to develop reasonableness in estimates as well as estimate and measure lengths, weight and volume.

LESSON SUMMARY

Create an "Estimation Station" with multiple estimating activities and centers where students work individually, in teams and as a whole group to develop estimating and number reasonableness skills. Estimation activities can be done daily and/or weekly.

GUIDING QUESTIONS

- What is an estimate?
- How do I make an estimate?
- What is a "reasonable" answer?

LET'S GET READY!

Hold up the prepared canister of candies/treats. *I wonder how many yummy treats are in this canister! I wonder how we can find out. I mostly wonder if anyone would like a treat!* Ask the students to share their ideas of how to determine the number of treats. Introduce or use the term "estimate" (depending on prior knowledge) and give each student one Magnetic Customizable Sheet square and Wet Erase Marker to record their estimate. Students also write their name or initials on their squares. Once the students have posted their estimates on the board, empty the contents and count together as a group. Count by 5's and 10's as needed. Analyze and compare one another's estimates with the actual number. For older students, extend further by creating a bar graph on the board with results.



DEFSMA510-V4



DEFSMA510-V4-WT



DEF5901

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Materials (Cont.):

- Small scales to measure weight in grams
- Measuring cups or beakers to measure liquid volume
- Metric rulers or measuring tape
- Multicolored candies or non-candy treats like miniature crackers
- Prepare one Carousel or Caddy partially filled with beans, macaroni pasta and rice. Ask students, "Which canister holds the most items?" Discuss answers then count the beans and pasta (skip counting by 5's, 10's and 20's as appropriate) and write the numbers on the board. Count a pinch of rice then point out it would take too long to count all of the rice. Ask how students came to their estimates without actually counting the objects. Discuss what students used as a point of reference to make their estimates. Point out the most reasonable estimates. Explain how making a reasonable estimate helps save time and creates a more accurate "sense" for numbers. Point out the difference in student estimates and encourage tolerance of error which is an important element of developing estimation skills.
- Prepare a colorful "Estimation Station!" sign and display in the Classic Image® Sign Holder

LET'S GET SET!

Estimating is important for real-world problem solving because it helps us save time and make informed decisions. Estimating helps us make educated guesses. Just like we need to exercise our bodies to be healthy and strong, estimating is a mental muscle we need to exercise to help us with math and problem solving life skills! Hold up three canisters from the Carousel or Caddy partially filled with beans, macaroni pasta and rice. Ask students, "Which canister holds the most items?" Discuss answers then count the beans and pasta (skip counting by 5's, 10's and 20's as appropriate) and write the numbers on the board. Count a pinch of rice then point out it would take too long to count all of the rice. Ask how students came to their estimates without actually counting the objects. Discuss what students used as a point of reference to make their estimates. Point out the most reasonable estimates. Explain how making a reasonable estimate helps save time and creates a more accurate "sense" for numbers. Point out the difference in student estimates and encourage tolerance of error which is an important element of developing estimation skills.

Next, partially fill one canister with beans or pasta and ask students to estimate the number in the canister. More students should demonstrate greater reasonableness in their estimates this time based on the comparison to the first estimation. For older students, partially fill two canisters with beans and pasta then ask students to make estimates of the total number of items for both canisters. This activity involves mental computations utilizing relative size with computing where they consider the sum relative to the number 10 and/or 100 (depending on how many contents are in the canisters).



DEF29003
(2 Units shown)

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NATIONAL EDUCATIONAL STANDARDS

- CCSS.MATH.CONTENT.K.CC.C.6—Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies.
- CCSS.MATH.CONTENT.K.MD.B.3—Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.
- CCSS.MATH.CONTENT.3.MD.A.2—Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.
- CCSS.MATH.CONTENT.2.MD.A.3—Estimate lengths using units of inches, feet, centimeters, and meters. Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.

LET'S GO!

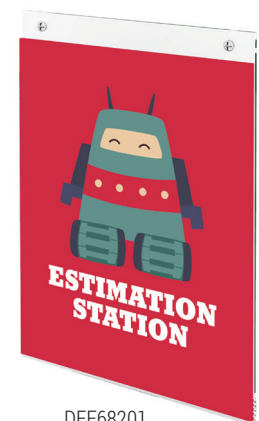
Choose from the grade level activities below to create an “Estimation Station” hands-on math center. Display the colorful “Estimation Station” sign in the Classic Image® Sign Holder at the station.

- Pre-K, Kindergarten and 1st Grade: Add an assortment of objects into the different canisters from either the Rotating Carousel or Stackable Caddy Organizers or both! Choose a variety of objects for the canisters; edible and non-edible, multiple colors, shapes, and sizes. Most Pre-K and Kindergarteners do best with smaller amounts of objects in estimating activities—25-40 items per canister. Decide if the estimating activities will be daily or weekly. Display all of the canisters at the same time to help build number sense and comparative skills as students build estimating skills through the year. Set up two different canisters at the Estimation Station to store the Wet Erase Markers and pre-cut magnetic strips. Display a magnetic board at the station for students to post their daily or weekly estimates. (This activity can also be done with sticky-notes and a laminated poster.)

When it's time to conclude estimating for a given canister (daily or weekly) gather students to count together, utilizing skip counting by 2's, 5's and 10's as appropriate. Analyze and discuss the results by organizing student estimates into clusters and/or a graph. Make observations about: Who estimated greater than/less than/the same? Compare the current canister to next week's (or next day's) canister, accessing new knowledge: “This canister had ____ objects. Predict how many ____ this canister has.” Record and/or publish estimation activities in pre-made data capture sheets, student math journals, graphs and posters.



DEF69201
Tabletop



DEF68201
Wall Mount

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ADDITIONAL RESOURCES

- *How Many Seeds in a Pumpkin?* by Margaret McNamara (Schwartz and Wade)
- *Weighing the Elephant* by Ting-xing Ye (Annick Press)
- PreK-1st grade video on estimation: <http://www.pbslearningmedia.org/resource/3db88fb7-83e5-4f74-94f2-e4213a524876/peg-and-cat-estimate-peg-cat/>
- K-5th grade estimation game: <http://www.pbslearningmedia.org/resource/0bfc41b4-35cd-45e5-9e5a-53f038c614a7/dino-drink-dinosaur-train/>

• 2nd and 3rd Grade:

Set up multiple centers for students to visit at the Estimation Station. Follow the instructions in the PreK-1st grade section to set up one center on canister estimating. Expand the canister estimation center to include questions about different attributes of the objects in the canister to engage both estimation, sorting and classification skills. Students make estimates according to attributes of the objects such as size, shape, and color then record and graph results.

Create two more centers at the Estimation Station which focus on measurement in units of inches, centimeters, grams and liters. Students will estimate length and weight of objects and volume of liquids. Students estimate "How much?" (liquid), "How long?" (ruler) and "How heavy?" (scale). Use the canisters from the Caddy and/or Carousel to contain liquids and objects. For liquid estimations, pour different liquids of varying amounts into the canisters. Add food coloring to water to help with comparisons. Students estimate amounts of liquid then check their estimates by measuring liquids in the beaker or measuring cup. For length and weight, use an assortment of objects in the canisters; small objects and larger objects. Students estimate length and weight then check their estimates using ruler/measuring tapes and small classroom scales. Record and/or publish estimation activities in pre-made data capture sheets, student math journals, graphs, posters or PowerPoint presentations.



DEF3901CR