MATH ESSENTIAL ELEMENTS LESSON PLAN

Estimation 180 Activities

Related Essential Elements

- Differentiate a fractional part from a whole. (EE.3.NF.1)
- Identify the appropriate measurement tool to solve one–step word problems involving mass and volume (EE.3.MD.2)
- Round any whole number 0–30 to the nearest ten. (EE.4.NBT.3)
- Use standard measurement to compare lengths of objects. (EE.4.MD.2)
- Determine the area of a square or rectangle by counting units of measure (unit squares). (EE.4.MD.3)
- Compare numbers up to 99 using base ten models. (EE.5.NBT.1)
- Use the number of zeros in numbers that are powers of 10 to determine which values are equal, greater than, or less than. (EE.5.NBT.2)
- Compare whole numbers up to 100 using symbols (<, >, =). (EE.5.NBT.3)
- Round two–digit whole numbers to the nearest 10 from 0—90. (EE.5.NBT.4)
- Identify models of halves (1/2, 2/2) and fourths (1/4, 2/4, 3/4, 4/4). (EE.5.NF.1)
- Use standard units to measure weight and length of objects. Indicate relative value of collections of coins. (EE.5.MD.1)
- Determine the volume of a rectangular prism by counting units of measure (unit cubes). (EE.5.MD.4)

Materials

- Vocabulary card for **Estimate**
- Computer with projector
- Access to any communication system used by the student that contains numbers
    - Optional:
    - Number grid or open number line
    - Concrete items for estimating for students with vision impairments

LESSON PROCEDURE	ALTERNATE RESPONSE MODES
Learning Goal **"I can use what I know about numbers and sets to estimate."** • Share learning goal with students and explain why estimating is important (*it helps us to more quickly work with larger numbers without needing to find exact numbers*.) • Have students state learning goal.	**Communication:** • Demonstrate learning goal using relevant word(s) on communication device (ex. **use, know, some**). • Record learning goal on voice-output switch. • Student points to picture cue card of learning goal while you cue them to say it in their head.

	• Student signs learning goal.
Vocabulary Word • Show the vocabulary card for the math word **Estimate**. • Provide definition: **"When we estimate, we use what we know about numbers and sets to make a thoughtful guess."** • Have each student point to or say the word **Estimate**.	**Communication:** • Students can verbally say the word, sign the word, point to the word, or use eye gaze to indicate the word.
Activity ***Note:** If you have associates in your classroom, invite them to participate in the activity as well. They can provide good estimation models and increase student engagement by getting involved.* • Complete an **Estimation 180 Activity**: www.estimation180.com 1. Select a day to open a lesson. 2. Show students the picture for the lesson. 3. Talk about the item in the picture and its size. 4. Discuss parameters for estimating (ex. For the Cheeseballs on the pan, items will be placed evenly on the pan without stacking). 5. As a group, establish a number that will be too low for the estimate and a number that will be too high. Write down these numbers. 6. Have everyone in the group give an estimate within the range established by the group. 7. Play the video that goes with the picture that shows the quantity being measured. 8. Pause the video 1-2 times. You will see the quantity changing with corresponding numbers as you pause it. Ask students if they would like to **keep their estimate or revise their estimate.** Guide students in keeping or revising their estimates based on the new information. 9. When the video ends, pause where it shows the actual answer. 10. Talk about who was close to the answer, who was far away, how close, how far, etc. 11. Discuss the following: a. What were we estimating? b. What did we measure? Quantity? Length?	**Related Core Vocabulary for AAC users: some, more, less, big, little, how, many, too much, too little** **Communication, Cognitive:** • Students with limited verbal skills may use their communication devices, a hundred chart, meter sticks, or numeral rolls (similar to measuring tape) to indicate their estimates. • When working with larger numbers, students may be given an open number line to indicate an estimate between a range of numbers. • Have all students give estimates- if they do not give an estimate, they will be less likely to care about the outcome. • Students can also have a choice between 3-4 numbers for responding with their estimate. • If students have difficulty with providing reasonable estimates after known quantities are revealed, they can be given a range of quantities to estimate between (ex. Between 10-30) and select a number in between the range. **Vision:** • Students with vision impairments will need to feel concrete sets of objects or containers and objects of similar sizes to the ones in the video. You can help them feel how

c. What would you do differently next time to make a better estimate? ***Note:** Some activities reveal the answer using videos and some reveal the answer with a single picture.*	full the container is or how large an item is to participate in these activities if they cannot visually access quantities presented on the screen. (ex. "This is how big the pan is. This is the size of the cheeseballs that will fill the pan.)

Generalization Activities

- **Snack Activity:** Model estimating appropriate portion sizes for snacks, talking about getting **some, a few, a couple, too much, too little** of an amount.
- Show students a quantity of snack or drink items. Have them estimate which bowl or cup will hold the amount.
- Give students different sized containers and have them estimate how many of an item it will take to fill the container. Place the amount they estimated in the container (If reasonable. If not reasonable, give them options to choose a more reasonable amount). Have them revise their estimates until they reach a quantity that fits the container.
- Give students a mystery bag of objects of varying amounts. Have them dump out the objects. Ask them to first estimate how many there are then count to check the actual amount.
- While baking cookies or preparing another snack, have students estimate how many cookies will fit on a pan. Try out different amounts and have them revise their estimates.
- Display a jar that holds a quantity of items. Have students estimate how many are in the jar. Count and verify as a class and have students see how close they were.
- Have students estimate how long it will take to do different routine activities (ex. Read a book, brush teeth, eat a snack). Record their estimates along with the actual time and compare the difference.
- Practice matching quantities of amounts to illustrate estimation terms: **some, a few, a couple, a little bit, a lot**
- Have students practice getting quantities of amounts of items (ex. Legos, beads, dry cereal, rice, etc.) when given directions to get **some, a few, a couple, a little bit, and a lot.**
- Examine clothing of different sizes to talk about and estimate which will be **too small, too big, or just right.**
- Engage in a craft activity (ex. Making necklaces or bracelets using string and beads). Have students estimate and then check string lengths to see what size they will need and amounts of beads to see how many they need. Work on having students request shorter or longer string until they find the right size and more or less beads until they find the right amount.
- Discuss examples of when you need to know an **exact number** (ex. how many pieces

of pizza you ate) and when it is better to **estimate** (ex. How many Cheerios you had in your cereal bowl). Play a game in which students indicate whether you should use exact numbers or estimates in different situations.

- Have students estimate which containers will hold a variety of items of different sizes from an array of different sized containers. Have them check their estimates by placing the items in the containers to see if they fit.
- Have students estimate how many cups of food they should feed a dog or cat. Have them then use a measuring cup and food bowl to test their estimate and determine the right amount.
- Have adults in the classroom share everyday examples of when they use estimation.

Vocabulary Card