Approximating Measures

Fourth-Grade Math
Higher Order Thinking (H.O.T.) Lesson 6

Tuesday, December 11, 2007
Topic: Approximating Measures
Approximate Time: 60 minutes

Learning Objectives:
The student will be able to –

1. Approximate the number of classroom objects that will fit in a bird's wingspan.
2. Mathematically compare a bird's wingspan to the lengths of different classroom objects.
3. Order birds' wingspans from least to greatest.

Language Objectives:
The student will be able to –

1. Describe what a bird's "wingspan" is.
2. Determine how "approximate" and "estimate" are similar.
3. Define "equal to" and "measure."
4. Describe what "length" and "twice as long" mean with concretes example.
5. Compare two objects' lengths by describing similarities and differences.

Materials:

1. "Kid Friendly" objectives
2. Pair norms poster
3. String
4. Yard Sticks
5. Scissors
6. 2 sets of bird cards
7. Approximating Measures handout
8. Think Card worksheet
9. Reflection

Procedures:

1. Hook – *Whole class*: Write Brown Pelican and Least Terns on board. Tape birds' pictures on board. Ask students to predict how long each bird's wingspan is. Cut string and show students actual length of wingspans. (7 ft or 84 in, 20 in respectively). (~5 min)
2. Go over objectives as whole class. Go over worksheet with students. Remind students of pair norms. Model good pairs work. (~5 min)
3. Break students into pairs. Give each pair a bird card. (Differentiate: smaller wingspans will make the problems more challenging).
4. Students work in pairs to complete the Approximating Measures handout. Help students as needed.
5. When students are finished, they should work on Think Cards worksheet in pairs.
6. After about 30 min. of pairs work, each pair presents their bird by:
    a. showing class the bird card

b. revealing bird's wingspan
c. sharing one item from their worksheet

Tell students to listen very carefully during presentations! (~15 min)

Closure:

WITHOUT TALKING, line up in order of your bird's wingspan (from least to greatest). One partner stands in front of the other. Students may use whatever materials they want as long as there is no talking. (~5 min)

Collect all materials.

If time, students complete independent reflection. If not, complete reflection after lunch.

Assessments:

1. Pairs discussion
2. Whole-class discussion
3. Approximating Measures handout
4. Think Cards worksheet
5. Presentations
6. Independent reflection

Your Name: _____ Date: _____

Partner's Name: _____

Approximating Measurements

Directions: Work with your partner to answer the questions. You both need to turn in a worksheet.

1a. APPROXIMATE the number of desk lengths that equal your bird's wingspan.

_____

1b. Explain the reasoning behind your answer in 1a.

_____

_____

_____

Now cut a piece of string that is equal to your bird's wingspan. Use the string to help you answer the following questions.

1c. By MEASURING, determine how many desk lengths equal your bird's wingspan. _____

2a. Find an object in the room that is ABOUT the length of your bird's wingspan. Record it below.

_____

2b. Find an object in the room that is ABOUT **twice the length** of your bird's wingspan. Record it here: _____

3a. Compare your bird's wingspan to another object in the room. Write the object below.

_____

3b. DESCRIBE how the object in question 3a compares to your bird's wingspan. Try to use math words in your description.

_____

_____

L. Jain, Neag School of Education

Name: _____ Partner's Name: _____

Think Card #1

Suppose an average fourth grader is 4 feet tall. Describe how your bird's wingspan compares to an average fourth grader's height. (Hint: what kind of number would you use to show a **ratio**?)

Think Card #2

The Ruby-throated Hummingbird has the **fastest wing beat** of all the birds in North America. If the bird's wing beat is 70 times per second, what is the wing beat per minute?

Think Card #3

The Tundra Swan has the **most feathers** of any bird in North America. The Tundra Swan has 25,216 feathers! The Ruby-throated Hummingbird only has 940 feathers. ESTIMATE how many more feathers the Tundra Swan has than the Ruby-throated Hummingbird.

Think Card #4

The Red-eyed Vireo does the **most singing** of any bird in North America. If the bird can sing 22,197 songs in 10 hours, how many songs can it sing per hour?

Think Card #5

The Thick-billed Murre can **dive** 689 feet below the water surface! Why might this bird need to dive so far below the water surface?

Bird statistics from www.birdiq.com

Name: _____ Date: _____

Reflection

Directions: **Answer each question using complete sentences.**

1. Write down one thing you learned from this lesson.

_____

_____

_____

2. What is a good strategy to use when you need to approximate?

_____

_____

_____

3. Is there anything confusing from this lesson? If so, describe what it is. If not, explain why you think you understand everything from this lesson.

_____

_____

_____