



Measuring a Fish

Focus on Inquiry

Students will compare the length of different fish and use accurate measurement techniques to solve story problems about comparing lengths.

Lesson Content Overview

Students will practice estimation and measuring using the appropriate tools (such as rulers, yardsticks, meter sticks, and measuring tapes) in this lesson. The students will solve comparison story problems involving different lengths of fish. Students will estimate the length of the fish before using their tools to make an exact measurement. According to the Louisiana Department of Education (2021), students are expected to be able to express the length of an object as a whole number of length units by laying multiple copies of a shorter object (the length unit) end to end. Students should also understand that the length measurement of an object is the number of same-size length units that span it with no gaps for overlaps.

Duration: 75 minutes

Setting: Classroom

Grouping: Various grouping throughout the lesson

Grade Level: 1st - 2nd grade

Louisiana Mathematics Standards--Elementary

| Standard | Description |
|----------|--|
| 1.OA.A.1 | Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions. |
| 1.MD.A.2 | Express the length of an object as a whole number of length units by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. |
| 1.MD.C.4 | Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another. |
| 2.MD.A.1 | Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks. |

Prior Knowledge Needed by Students

- How to read a ruler or use inch blocks
- The difference in measurement units
- How to use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

Materials

- Measuring a Fish T-chart (provided)
- Inch blocks or rulers
- Notebooks
- Measuring fish handout (provided)
- Fish stories handout (provided)
- Adapted Problems for Challenge (optional)

Background Information for Teachers

Measurements are ways that students determine the relation of a quantity with a certain numerical value. To accurately describe these quantities, students need to have the proper knowledge and tools. These tools can include scales, rulers, clocks, measuring cups, spoons, and cylinders.

According to Lesson Research (2021), students go through different learning stages for measurements. These phases occur in grades K-2. Students need to be exposed to these types of measurements for later mathematical skills. The first phase involves direct comparison. Students will start by looking at length by comparing two objects. Students will learn the difference between which one is longer and which one is shorter. The second phase is called indirect comparison. Students will use a third object to compare to two other objects. This phase yields students to understand the concept of transitivity where $a > b$ and $b > c$ so then $a > c$. The next stage is measuring with arbitrary (non-standard) units. This thinking occurs when students use a known quantity, like a unit tile or inch block, to measure items. Students begin to associate that there are consistent units of measurement and that all objects have a unique measurement. The last phase is measuring with standard units. Students begin to learn that all measurements have units that are associated with them. These units are needed to determine the length and width of objects accurately.

Engage (5 minutes)

- 1) Teacher will start the lesson with a survey about student preferences regarding white or chocolate milk. The teacher will have a T-chart on the board. Teachers can have paper copies of T-chart for students to record data and place in notebooks.

Chocolate Milk or White Milk?

| Chocolate | White |
|-----------|-------|
| | |

2) Teacher will ask students to think about whether they would rather have chocolate or white milk. Students will record their answers on the board (and in their notebooks).

3) After students have completed the survey, the teacher will ask the students:

- What can we tell from our survey?
- What did you learn from our results?
- How could I represent this information using math?

Explore (15 minutes)

1) Teacher will have students make a circle on the floor and asks one student for their shoe. The teacher should find the student with the smallest shoe and place it next to their shoe.

2) Teacher will ask students which shoe is longer and by how much. Students can use their hands or discuss their answers aloud. The teacher will explain to students that mathematicians like to be accurate when they make measurements. Precise measurements should be done by using a ruler.

3) The teacher will get a ruler, a yardstick, and a meter stick out (use inch tiles for first graders). The teacher will ask students which ruler they think is the best to measure the shoes. Students will provide answers and reasoning. (Teacher can also use inch tiles to visualize this concept to students.) The teacher will then ask students how they think the ruler will be used to measure the shoe. The students should inform the teacher that the shoes should be placed at the back of the ruler, and the number on the other side of the shoe is a measurement.

4) The teacher will explain to students that today they will do the same thing with some fish. In their centers, they will solve fish stories that compare fish. The teacher will give the following example to students: Tim caught a bass that was 4 inches long. Then he caught a sunfish that was 7 inches long. How much longer was the sunfish?.” The teacher will walk the students through the steps on how to solve the problem. Before answering, they will model their thinking and write an equation to represent what they did in their notebooks.

Explain (10 minutes)

1) During center time, students will be able to measure the length of different fish. Before students measure the fish, they should estimate how long (optional: and how wide) each fish on the handout is.

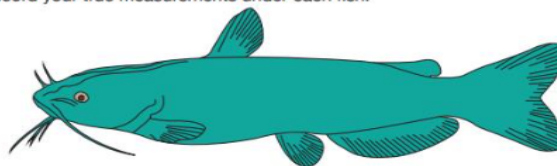
2) After students have written down their estimation, they will measure each fish using the tools to determine how long (optional: and how wide). Students should write their answers down in the spaces provided.

3) Optional: Inform students that fish under a specific measurement (chosen by) are illegal to be kept and have to be thrown back into the water. Students will determine which fish can be caught or which have to be thrown back.

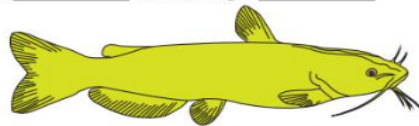
4) Optional: Inform students that fish caught have to be between a certain size. Fish that are too big or too small are considered to be outside the slot limit. These fish must be thrown back into the water. The teacher will tell students to imagine that the size range for the fish they caught must be between four and six inches. Students will determine which fish they can keep and which have to be thrown back into the water.

Measuring Fish

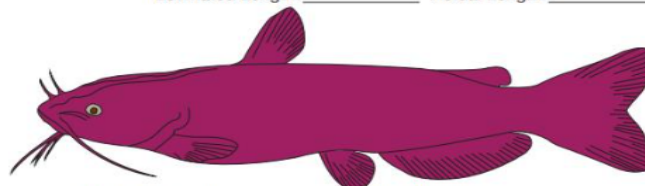
First estimate how many inches long you think each fish is from head to tail. Next go back to the top of the page and use your inch ruler to see how close your guesses are! Record your true measurements under each fish.



Estimated Length: _____ Actual Length: _____



Estimated Length: _____ Actual Length: _____



Estimated Length: _____ Actual Length: _____



Estimated Length: _____ Actual Length: _____

Expand (20-30 minutes)

- 1) Students will work on the Fish Stories from the previous sections.
- 2) Fish Stories: The teacher will need to give each student a copy of the activity. Students will work on two different types of problems (one is adapted problems for a challenge). Students should complete these activities independently with one-on-one time with the teacher if needed. Students will bring their work to the teacher when they are done to see how well they did and receive the next activity.

Evaluate (15 minutes)

- 1) Teacher will discuss with students why accurate measurements are important, especially in math class, plus give students tips on eliminating some mistakes.
- 2) The teacher will create a T-chart to record student answers. Column 1 will include the challenges that students face or believe students could come across. Column 2 will provide tips on how to overcome these challenges.

*Note: This plan was modeled after T. Young's The Fishing Trip lesson.

References

Lesson Research. (2018). *Measurement*. The Lesson Study Group.
<https://lessonresearch.net/content-resource/measurement-2/>.

Louisiana Department of Education (2021). *Academic standards + grade level expectations*. Louisiana Believes - Louisiana Department of Education.
<https://www.louisianabelieves.com/resources/library/academic-standards>.

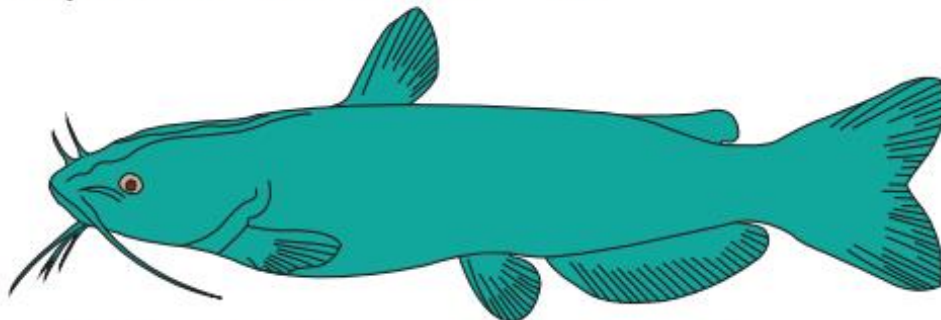
Young, T. (2014). *The fishing trip*. BetterLesson.
<https://betterlesson.com/lesson/565287/the-fishing-trip>.

Chocolate Milk or White Milk?

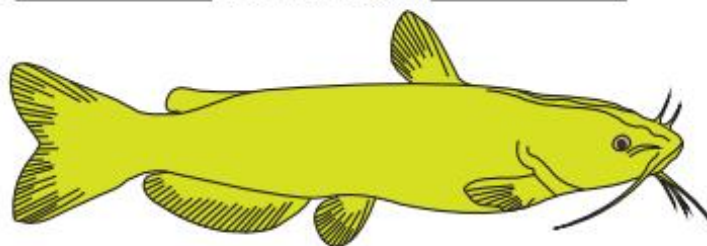
| Chocolate | White |
|-----------|-------|
| | |

Measuring Fish

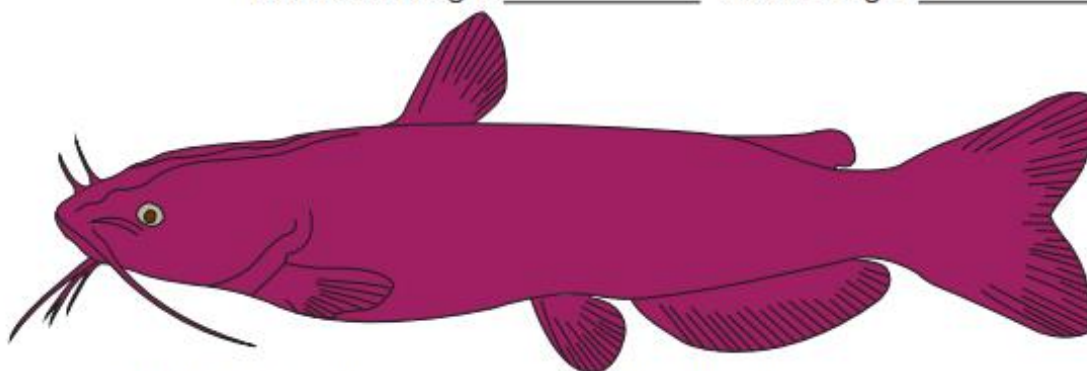
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Estimated Length: _____ Actual Length: _____



Estimated Length: _____ Actual Length: _____



Estimated Length: _____ Actual Length: _____



Estimated Length: _____ Actual Length: _____

Name:

Date:

Solve the fish stories. Make sure to show your thinking.

1. Pat caught a bass that is 7 inches long. He caught a sunfish that is 10 inches long. How much longer is the sunfish than the bass?

2. Pam caught a bass that is 6 inches long. Tim caught a bass that is 7 inches long. How much longer is Tim's bass than Pam's bass?

3. Pam caught a bass that is 3 inches long. To be legal, a fish must be 6 inches long. How much longer would Pam's bass need to be to be legal?

4. Tim's sunfish is 4 inches long. Ann's sunfish is 6 inches long. How much shorter is Max's sunfish than Ann's sunfish?

Name:

Date:

Solve the fish stories. Make sure to show your thinking.

1. Pat caught a bass that is 17 inches long. He caught a sunfish that is 10 inches long. How much longer is the bass than the sunfish?

2. Pam caught a bass that is 16 inches long. Tim caught a bass that is 7 inches long. How much longer is Tim's bass than Pam's bass?

3. Pam caught three fish. One was 7 inches long, one was 3 inches long and the other was 4 inches long? Tim caught three fish that were 6 inches each. If each person lined their fish up in a line; Who would have the longest line? How much longer would it be?

4. Tim' caught three fish. One fish was 5 inches long, another fish was 6 inches long. When he measured all of his fish in a line, it totaled 18 inches. How long was his third fish?