

Measurement


Mass, Weight and Volume

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K.MD.1

Describe measurable **attributes** of objects, such as length or weight.
Describe several measurable **attributes** of a single object.

| | | | |
|---|--------------------------------------|--|----------------------------|
|  | | | Common Core Standard |
| Identify attributes | Identify measurable attributes | Describe measurable attributes of objects: heavy/light | KMD.1 |

About the Math

- Critical for students to identify and describe different **attributes** of an object(s).
- Develop **comparison** skills and encourage students to use the proper **tools** and **persevere** in finding solutions.
- Develop essential vocabulary and meaning: **more/less, heavier/lighter**


My Pet Rock

1. **Choose** one of the rocks from the nursery.
2. Closely **examine** your rock and **describe** five **attributes** and **share** with your neighbor.
3. **Discuss** and **identify** which of the attributes you described are **measurable**.



KMD.2

Directly compare two objects with a measurable attribute in common, to see which object has **“more of”/“less of”** the attribute, and **describe the difference.**

| | |
|--|----------------------------|
|  | Common Core Standard |
| **Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. (K.MD.1) | K.MD.2 |

Comparing My Rock!

Materials: a box of “treasures”, pet rock, balance scales

Part 1: Using your rock, find and list 5 things heavier and 5 things lighter than your rock.

Comparing my Rock!

Using your rock, find five things heavier than your rock.

1. _____
2. _____
3. _____
4. _____
5. _____

Using your rock, find five things lighter than your rock.

1. _____
2. _____
3. _____
4. _____
5. _____

Making Math Magic

- ✓ Introduce the balance scale and allow students to determine how to identify if an object is heavier or lighter than another object.

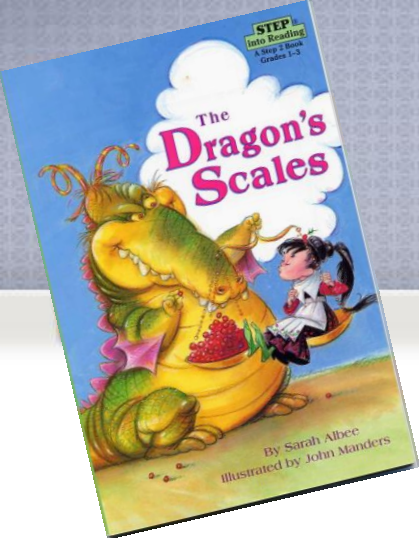
Center 2

Using My Discovery Skills

- Select 2 items from the box of treasures and make direct comparisons to determine which item is heavier/lighter. Repeat for 5 pairs of items.



- ✓ Observe to see if a student uses “size” as an attribute to determine which item is heaviest. Encourage students to find an object, although larger in size, that is actually the lightest in their comparison.



The Dragon's Scales

by Sarah Albee

Essential Understanding

- Discuss how to determine if an object is lighter or heavier than another object.
 - Discuss which tools are used to measure how heavy or light an object is.
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- ✓ Review attributes and discuss which can be used to determine how heavy or light an object is. For example, does color make a difference? Size of an object? Shape? Quantity?
 - ✓ Discuss what strategies the young girl, in the story, used to outsmart the dragon.

Center 3

Essential Questions:

- ✓ How can we find out how much an object weighs?
- ✓ Why is it important to know how much things weigh?
- ✓ Is a bigger object always the heaviest?



Which Will Weigh More?
The Dragon Scales by Sarah Albee

Predict which will weigh more: (Circle your answer)
Two Peas One Apple

Was your prediction correct? Why or Why not?

Predict which will weigh more: (Circle your answer)
Small bag of gold Big bag of cotton

Was your prediction correct? Why or Why not?

Predict which will weigh more: (Circle your answer)
Bucket of feathers Bucket of bricks

Was your prediction correct? Why or Why not?

3.MD.2

Measure and **estimate** liquid volumes and **masses** of objects using standard units of grams (g), kilograms (kg), and liters (l).

- ✓ Students need to work with standard measurement units including cups, gallons, inches, feet, and miles. Students do not need to convert between units.

How Close Can I Get?

- Materials: a box of “treasures”, cm cubes (each has a mass of 1 gram), gram weights, balance scales
- Examine a cm cube or gram weight.
- Choose an object from the box
- Estimate the mass of the object (number of grams)
- Find the actual mass of the object using the balance scale.

Center 4

- The terms **mass** and **weight** are used interchangeably within the math standards.
- Encourage the use of **units** with writing data.
- Discuss student estimates.

How Close Can I Get?



The mass of each small cube is 1 gram.
Choose any object and estimate its mass. Record your answer.
Find out how many grams it takes to balance your object on the scale.
Record the actual mass of the object.
Complete 4 more times.

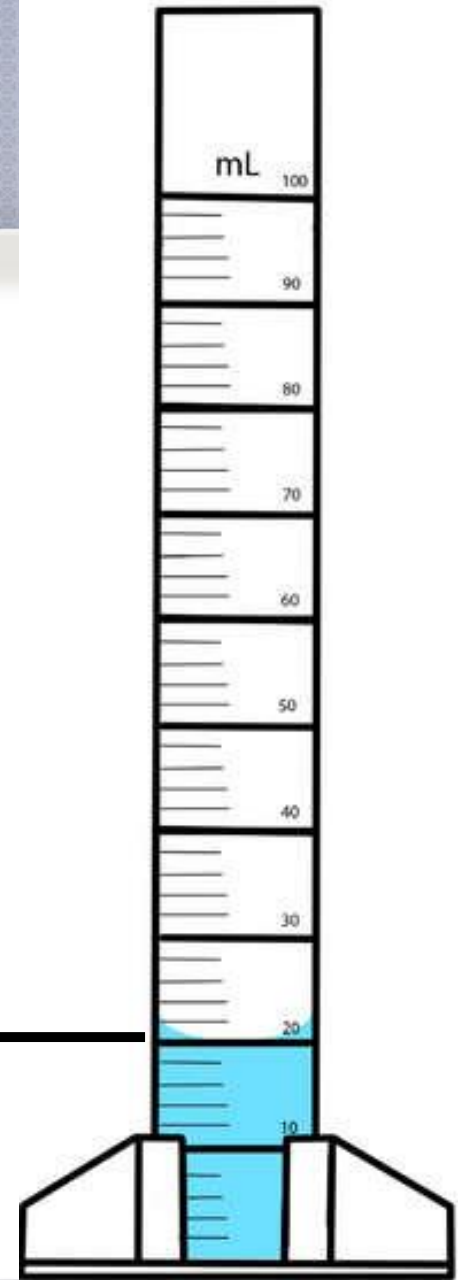
| Object Description | My estimate of the object's mass in grams (g) | Actual mass of the object in grams (g) |
|--------------------|---|--|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

- ✓ Did their estimates get closer to the actual mass? Why or why not?

3.MD.2

Volume

- **Measure and estimate liquid volumes** and masses of objects using standard units of grams (g), kilograms (kg), and liters (l).



Finding the Greatest Volume

Materials: various containers, material to fill the containers (beans, rice, sand, lentils, etc.) spoons

Descriptions:

- Select 3 containers
- Put them in order from which will hold the most to the least.

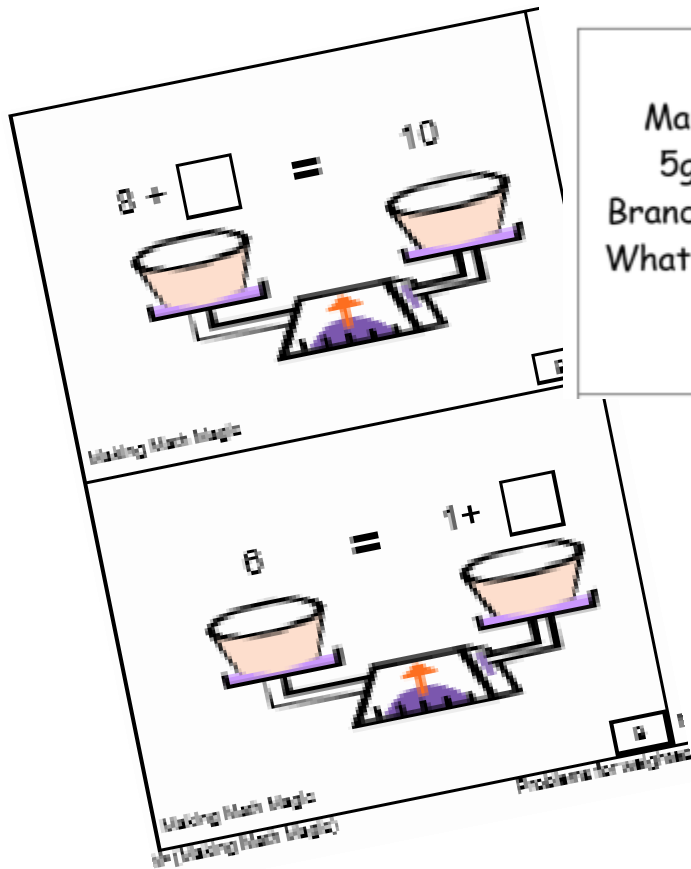


The Rest of the Story...

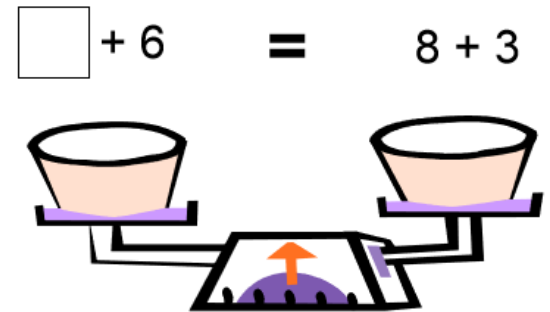
.... Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem. (Excludes multiplicative comparison problems (problems involving notions of “times as much”).

Center 6

Using the operations to solve one step word problems



Mary mouse has a mass of 5grams and her brother Brandon has a mass of 9grams. What is the total mass of both Mary and Brandon?



Making Math Magic

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Brittany made pancakes for the school picnic. She poured in 45 liters of water, 7 liters of batter and a litter of heated butter. How much mixture did she have when finished?