

Fish Experiment



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**Do you need an idea for a scientific study?
Try out one of our ideas or make one of your own.**

Start learning right now about how changing water temperatures and other factors can affect fish that live in a lake. Take the following brief quiz to see how much you already know about fish respiration. See the bottom of page 4 to check your answers.

1. The water in a typical lake has about what percentage of oxygen as compared to the percentage of oxygen in air?
 - a. about 0.3% of the oxygen in air
 - b. about 3% of the oxygen in air
 - c. about 30% of the oxygen in air
 - d. about 60% of the oxygen in air
2. A normal goldfish does *not* have a stomach.
 - a. true
 - b. false
3. Most people know that a group of cows is called a herd. What is the “official” name for a group of goldfish?
 - a. a gaggle
 - b. a parliament
 - c. a glitter
 - d. a troubling
4. About how long is the memory span of a goldfish?
 - a. 3 minutes
 - b. 3 hours
 - c. 3 days
 - d. 3 months
5. A normal goldfish must sleep with its eyes open because it does *not* have eyelids.
 - a. true
 - b. false



The Colors of Goldfish

Like M&M's™ and other snack foods, Goldfish Crackers™ made by Pepperidge Farms now come in colored assortments. Your task is to determine if the makers of the crackers favor one color over the others by finding the percentage of each color cracker in a bag of the snacks.

Materials

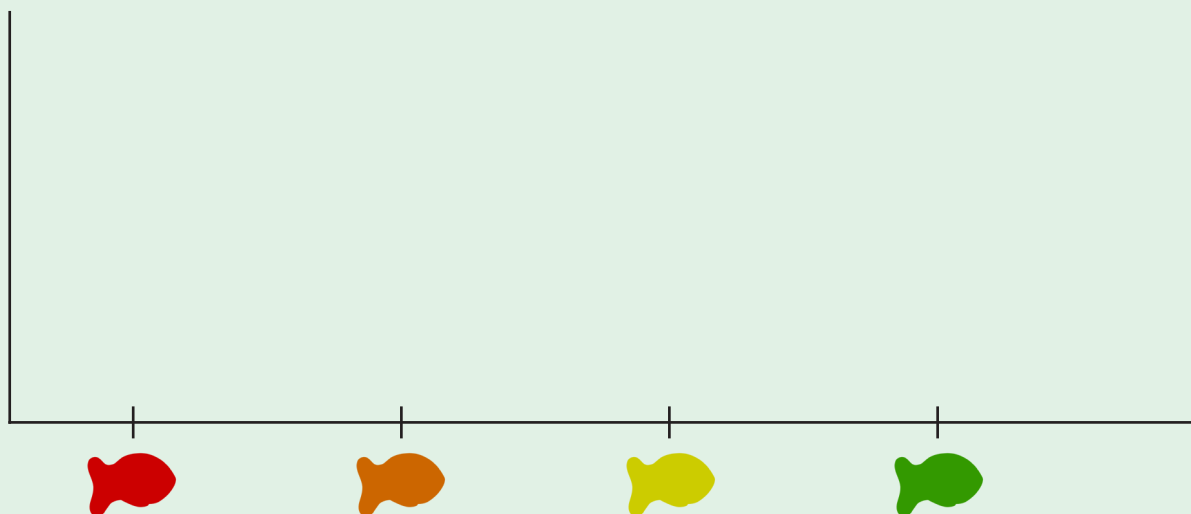
- 2- large flat paper plates
- 1- small bag of Goldfish Colors Crackers™

Procedure

1. Get permission before you start this activity and make sure that you are not allergic to any ingredient before handling the crackers.
2. Wash your hands thoroughly with warm water and soap before starting this activity so you can eat the crackers at a later time.
3. Pour about $\frac{1}{2}$ of the bag of crackers onto each of the two plates. This is done so you have room to move the crackers around and can easily count the crackers and move them to the side of the plate once they are counted
4. Count and record in Table 1 the number of each color of crackers.
5. Carefully pour the crackers back into their original bag to enjoy later. Make sure to seal the bag so that the crackers stay fresh.
6. To find the percentage of each fish color, divide the number of fish of one color by the total number of fish in the entire bag. Then multiply this value by 100 to convert to a percentage.
7. Use your count data from Table 1 to make a bar graph below.

Table 1.

Color	Red	Orange	Yellow	Green
Count				
Percentage				



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Cricket Thermometer

Goldfish are not the only organisms that respond in an obvious way to relatively small changes in their environment's temperature. Crickets respond by changing their number of chirps based on the hotness or coldness of their surroundings. In fact, the Old Farmer's Almanac® provides a formula for converting cricket chirps to find the air temperature in degrees Fahrenheit or Celsius. To find the temperature in Fahrenheit (°F), first count the number of cricket chirps in 14 seconds. Once you have this value, add 40 and the resulting sum is the air temperature in °F. For example, if a person counted 25 chirps in 14 seconds, the air temperature would be 65 °F and was found using the following:



Photo Credit: Naveen Matthew

$$25 \text{ chirps} + 40 = 65 \text{ }^\circ\text{F}$$

To find the air temperature in degrees Celsius (°C), count the number of cricket chirps in 25 seconds. Divide this number by 3, and lastly, add 4 to that quotient. For instance, if a person counted 36 chirps in 25 seconds, the air temperature would be 16 °C. The equation below shows how this answer was found.

$$36 \text{ chirps} / 3 = 12 + 4 = 16 \text{ }^\circ\text{C}$$

Amos Dolbear is most often credited with first publishing the notion of using crickets as a thermometer back in 1897 in his article titled: The Cricket as a Thermometer. He based his study on the snowy tree cricket. Although most crickets do change their chirping rate based on temperature, some species of crickets do not follow the exact equations described above. In fact, some crickets change their rate of chirping based on their age and/or on their mating status.

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Answers: Page 2 Answers: 1) b, 2) a, 3) d, 4) d, 5) a.

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