ALL WASHED UP!

E X P E R I M E N T

SOAPY SOLUTIONS

Materials Needed:

- Cooking oil
- Cinnamon
- Access to sink to wash hands
- Measuring spoons (teaspoon and tablespoon)

QUESTION

What is the most effective way to remove bacteria from your hands?

MY HYPOTHESIS:

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GETTING READY

Ask three classmates to volunteer for the experiment.

PROCEDURE

For the student volunteers:

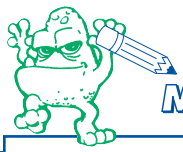
1. Rub 1 tablespoon of cooking oil all over your hands until completely coated. Sprinkle 1 teaspoon of cinnamon on hands and rub it around until it's evenly distributed. The cinnamon will be like bacteria. It's all over!
2. Wash hands as follows, **rubbing them briskly for 20 seconds**:
   - *Student #1*: wash hands with **cold water** and **no soap**
   - *Student #2*: wash hands with **warm water** and **no soap**
   - *Student #3*: wash hands with **warm water** and **soap**

For the rest of the class:

1. Observe the three handwashing methods.
2. Record the results.

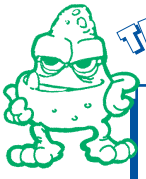
Check to make sure there is handwashing soap at every sink in your home and at school.

- The method of handwashing that removed the most "bacteria" was:
- The method that removed the least "bacteria" was:
- Illustrate how the hands of Students 1, 2 and 3 looked after washing.



MY CONCLUSIONS

- I can remove bacteria from my hands by:
- If I used only cold water and no soap to wash, this is what might happen:
- Why does the . . .
  - **Warm water help**?
  - **Soap**?
  - **Rubbing**?



TELL YOUR FAMILY . . .

Encourage all family members to wash hands with soap and warm water for 20 seconds.

ALL WASHED UP!

E X P E R I M E N T

There's More Than Meets the Eye

Materials Needed:

- Two small Delicious apples, washed in advance (but not by the person cutting the apples)
- Potato peeler
- Small, clean knife
- Cutting board
- Two sterilized jars (see "tip" at left) with screw-top lids
- Masking tape or gummed labels
- Felt-tip markers

QUESTION

Is it important to wash your hands before handling, preparing, or serving food — even if they look clean?

MY HYPOTHESIS:

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GETTING READY

Label the jars:

- Jar 1 — Washed Hands
- Jar 2 — Unwashed Hands

Choose a class volunteer to perform the experiment. Make sure his/her hands haven't been washed in several hours!

PROCEDURE

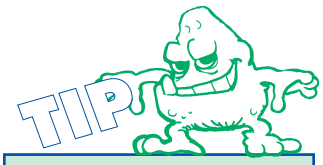
1. Without washing hands, peel one apple and cut it in half on the cutting board.

For the Class Volunteer:

2. Place one half of the apple in the jar labeled "Unwashed Hands." Screw the lid on tightly, compost the remaining apple.
3. Wash your hands thoroughly with soap and warm water for 20 seconds. Now wash the potato peeler, knife and cutting board with soap and warm water.
4. Peel the second apple and cut it in half.
5. Place one half of the apple in the jar labeled "Washed Hands." Screw the lid on tightly and compost the remaining apple.
6. Place jars in a warm place.

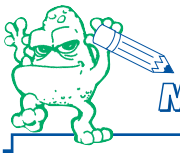
For the Class:

7. Observe the jars once daily for a week and record your observations.



To sterilize: *Wipe clean with rubbing alcohol or wash in the dishwasher.*

- **Describe:** Do the apples look the same? If not, describe how they are different.
- **Illustrate:** Draw pictures of both apples to show how they look after two days and at the end of the week.
- **Chart:** Create a chart or graph to record your data.



MY CONCLUSIONS

- This is what happened to each apple:
- I think the apples looked different because:
- This is what I learned about the food that I touch and eat:

TELL YOUR FAMILY . . .

Make "Wash your Hands" reminders to hang near the kitchen sink or on the refrigerator at home to make sure that your family members are "All Washed Up" before they handle food.

E X P E R I M E N T

SAFELY SEPARATE

Materials Needed:

- 2 clean sponges, cut in the shape of chicken legs
- Red or other brightly-colored poster paint
- Paint brush
- Cutting board
- Cucumber
- Clean, light-colored plate
- Serrated knife

QUESTION

Is there a potential danger in using the same equipment to prepare raw meat and other foods?

MY HYPOTHESIS:

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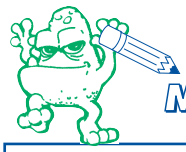
PROCEDURE

1. Dampen both sponges. Set one sponge aside to represent the "cooked chicken."
2. Paint both sides of the other sponge to represent raw chicken. Pretend that the paint is the juice of the chicken that may have been contaminated with Salmonella!
3. Place the painted sponge on the cutting board and use a knife to cut the sponge in half. Move the painted sponge onto the plate, and don't wash the cutting board.
4. Next, cut a slice of raw cucumber on the same cutting board you used in Procedure #3.
5. Now, place the clean sponge ("cooked chicken") that was cooked well-done on the plate with the "raw chicken" sponge.

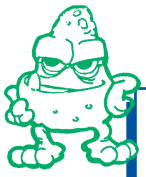
- After #3, this is where I observed the paint (representing Salmonella) on —
  - the cutting board:
  - the knife:
  - my hands:
  - the plate:
- After #4, this is what happened to the cucumber slices:
- After #5, this is what happened to the "cooked chicken" sponge:
- Chart the path of "Salmonella" paint between each item.



MY CONCLUSIONS

- This is how I can get rid of the paint "bacteria" on —
  - the cutting board:
  - the knife:
  - my hands:
  - the plate:
- If I touch something else without washing my hands — or use the knife again — this is what can happen:
- To kill the bacteria on the chicken, it is important to:
- If someone ate the raw cucumber, this is what could happen:
- This is what can happen when cooked chicken is placed on the same plate as raw chicken:

Plastic ("non-porous") cutting boards are easiest to clean.



TELL YOUR FAMILY . . .

Remind your family members to wash all cutting boards and utensils between uses in the dishwasher or with hot water and soap.

Be sure to always rinse vegetables and fruit in cold water before eating or preparing them!

HOT STUFF

E X P E R I M E N T

PROPER PATTIES

Materials Needed:

- ¼ lb. of fresh, lean hamburger meat
- Food thermometer
- Access to toaster oven with a broiler and broiler tray (or an electric fry pan)
- Pot holder

QUESTION

How can you tell when a hamburger patty is cooked to a safe temperature?

MY HYPOTHESIS:

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PROCEDURE

1. Form a round, thick (1") hamburger patty. Measure and record the temperature of the patty ¼" from the edge. (See chart below.)
2. Now, take the meat's temperature in the very center of the patty. Then wash the thermometer thoroughly.
3. Place the patty on the toaster oven broiling tray.
4. Place the tray in the toaster oven and turn the dial to broil.
5. When the burger looks cooked on one side, have your teacher turn over to brown the other side. Remove it from the toaster oven.
6. Now take the patty's temperature ¼" from the outside edge, and again in the center of the patty. This must be done quickly so the patty doesn't lose its heat! Record your temperature reading on the chart below.
7. If the temperature reading is less than 160°F/71°C, place the patty back in the oven and then take the meat's temperature every two to three minutes until the temperature is 160°F/71°C in the center.
8. Cut open the patty and observe the inside.

Hamburger Temperature Results

	Raw	Test 1 When outside looks cooked	Test 2 Time:	Test 3 Time:	Test 4 Time:	Done/ Safe to Eat Time:
¼" from edge						160°F/71°C
Center						160°F/71°C
Difference						0

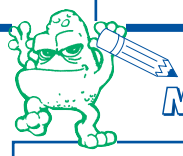
Thermometer Tips:

- *Make sure the thermometer goes straight into the meat and does not come out the other side to touch the pan!*
- *Thermometers should be washed with soap and hot water each time you take the temperature of the meat.*

DID YOU KNOW?

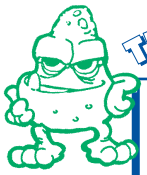
When a piece of meat is "ground up" to make hamburger, the bacteria that was on the surface of the meat can end up on the *inside* of the burger! That's why it's so important to cook the *whole burger* to a safe temperature of 160°F/71°C!

- When I measured the meat temperature ¼" from the edge and in the center the first time, the outside of the patty looked:
- When the thermometer read 160°F/71°C in the center,
  – The outside of the patty looked:
  – The inside of the patty looked:



MY CONCLUSIONS

- The best way to tell if the hamburger is done and safe to eat is to:
- It's important to wash the thermometer after each use because:
- When meat is cooked to 160°F/71°C:
- If hamburger is not cooked to 160°F/71°C, this is what could happen:
- What do you think? Does the color of meat tell you whether it is cooked enough to be safe to eat?



Check to see if your family has a food thermometer and uses it!
Let them know what you learned about making meat safe to eat!
Wash your hands after handling raw meat or poultry!

HOT STUFF

E X P E R I M E N T

BE A GOOD EGG

Materials Needed:

- Three large raw eggs
- Electric "hot pot" with access to outlet or pan (with lid) with access to heat source
- Slotted spoon
- 1 small, clear cup or jar
- 3 small paper plates
- Knife
- Permanent marker
- White sheets of paper for each student
- Pencils; yellow, orange and red crayons or markers
- Access to cold water

QUESTION

How do you know when a hard-cooked egg is safely cooked?

MY HYPOTHESIS:

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GETTING READY

Choose three classmates to be "egg peelers."

Label the eggs and paper plates with permanent marker:

- #1: cooked 2 minutes
- #2: cooked 8 minutes
- #3: cooked 15 minutes

PROCEDURES

1. Carefully place the three eggs in cold water in electric "hot pot" or pan. Heat until boiling; remove from heat and cover with lid.
2. Remove Egg #1 with the slotted spoon after 2 minutes, and cool under cold water.
3. Remove Egg #2 6 minutes later and cool under cold water.
4. Let Egg #3 stay in the hot water for 7 minutes more (total time: 15 minutes). Then cool under cold water.
5. Have each "egg peeler" peel one of the three cooked eggs, cut the egg in half, and put it on its labeled paper plate.
6. Observe and record the differences between the three eggs! (Use chart below.)

Record your observations: What do you see?

Part of egg	#1: Cooked 2 minutes	#2: Cooked 8 minutes	#3: Cooked 15 minutes
Yolk			
White			

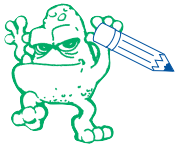
DID YOU KNOW?

A raw egg spins more slowly than a cooked egg! The liquid inside the raw egg slows it down!

Illustrate: Draw a picture of each egg using pencil and yellow or orange marker or crayon to show the whites and the yolk. How are the yolks and whites different in the three eggs?

Describe and Categorize:

- List as many words as you can think of to describe the whites and yolks of each egg.
- Circle the ones that indicate that an egg is safe to eat and put a red X through the ones that indicate it is not.



MY CONCLUSIONS

- This is what happens when you cook an egg longer:
- You can tell that an egg is cooked sufficiently by:
- What Do You Think? Is it okay to eat raw eggs if they are mixed in raw cookie dough?

Bring home your picture of the three eggs and post it on your refrigerator.

Remind your family to cook eggs until the yolks and whites are firm. Don't use recipes in which eggs remain raw or only partially cooked.

CHILL OUT

E X P E R I M E N T

COOLING COUNTS

Materials Needed:

- Hot water
- Measuring cup
- Shallow container (1 cup/500 ml minimum) } made from the same material, like plastic or glass
- Tall container
- Food thermometer
- Wire or string

QUESTION

Does the shape of a container affect the rate at which cooling takes place?

MY HYPOTHESIS:

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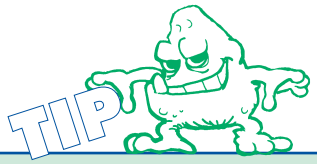
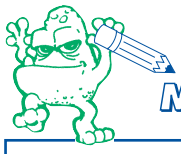
PROCEDURE

1. Pour 1 cup hot water into each container.
2. Check the temperature of the water in each container at 5-minute intervals, and record the times and temperatures. (See tip at left.)

- This is what I observed about the water cooling in each container:
  - Shallow:
  - Tall:
- Chart the results for temperatures at 5-minute intervals.



For tall containers, you may need to use wire or string to lower the thermometer into the water.



MY CONCLUSIONS

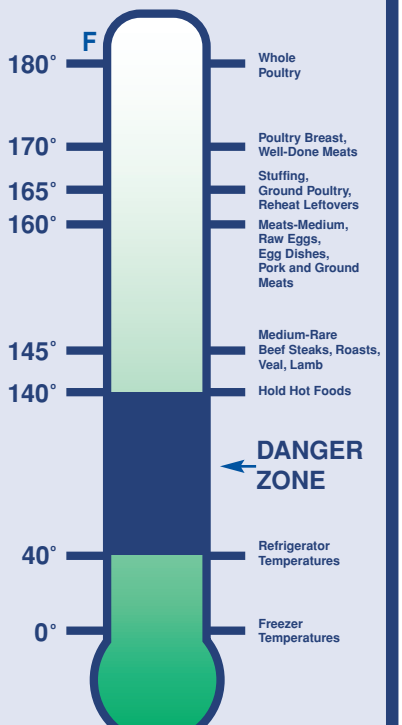
- It took the taller container longer to cool because:
- It is important for leftover food to be cooled down quickly when stored in the refrigerator because:
- If the water were clam chowder and it took a long time to cool down, this is what could happen:

DID YOU KNOW?

Bacteria grow quickest in the "danger zone" — temperatures between 40°F/4°C and 140°F/60°C.

RECOMMENDED
Safe Cooking Temeratures

These temperatures are recommended for consumer cooking.They are not intended for processing, institutional, or foodservice preparation.



For answers to your Food Safety Questions Call:

1-800-535-4555

USDA's Meat and Poultry Hotline

Check to see how leftovers are stored in your home. Encourage family members to use shallow containers.

CHILL OUT

E X P E R I M E N T

YEAST BALLOON BLOW-UP

Materials Needed:

- 2 balloons
- 3 500 ml beakers
- 2 250 ml flasks or small clear glass or plastic bottles with small openings
- Food thermometer to measure the temperature of the water
- Room-temperature water (about 70°F/21°C)
- 1/4 cup of sugar
- 1 package of dry yeast
- Warm water (about 110°F/43°C to 120°F/49°C)
- Ice water (below 40°F/4°C)

QUESTION

Can chilling food help stop the growth of bacteria?

MY HYPOTHESIS:

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GETTING READY

Fill the two balloons with air to stretch them; then deflate.

Label the beakers:

- 1 – "Mixing Beaker"
- 2 – "Warm Water Bath"
- 3 – "Ice Water Bath"

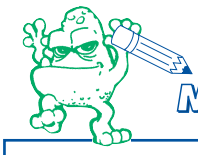
PROCEDURE

1. Fill the "Mixing Beaker" with 500 milliliters of room-temperature water. (Room temperature is about 70°F/21°C; use your thermometer to measure the temperature of the water.)
2. Dissolve the sugar in the room-temperature water. Add yeast to the sugar/water solution and stir gently to dissolve.
3. Pour half the solution into each flask. Carefully stretch the balloon openings to fit over the openings of the flasks and place one flask in each of the other two beakers.
4. Put warm water (about 110°F/43°C to120°F/49°C) into the "Warm Water Bath"- labeled beaker — just enough to cover the yeast mixture in the flask.
5. Put ice water (below 40°F/4°C) into the "Ice Water Bath" beaker. Again — just enough to cover the yeast mixture in the flask.
6. Observe and record what happens after 5 minutes. After 30 minutes. After 1 hour.

DID YOU KNOW?

- Yeast is a good microorganism — but it shows us how bacteria can multiply!
- The vocabulary word "perishable" describes foods on which bacteria could grow if not stored properly — like dairy products or vegetables. What other foods can you think of that are "perishable?"

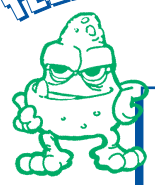
- My observations at each interval were:
  - 5 minutes:
  - 30 minutes:
  - 1 hour:
- This is what happened to the yeast in the warm water bath:
- This is what happened to the yeast in the ice water bath:



MY CONCLUSIONS

- If the yeast in the warm water bath were dangerous bacteria instead of harmless yeast microoganism, what could you say the warm environment does?
- If the yeast in the ice water bath were dangerous bacteria instead of good yeast, what could you say the cold environment does?
- What would happen if you put a sample of the yeast/sugar solution in the refrigerator?
- How do yeast and bacteria act the same?
- What effect did the cold temperature of the ice water have on the yeast?

TELL YOUR FAMILY . . .



Always store "perishable" foods in the refrigerator to prevent bacteria growth.