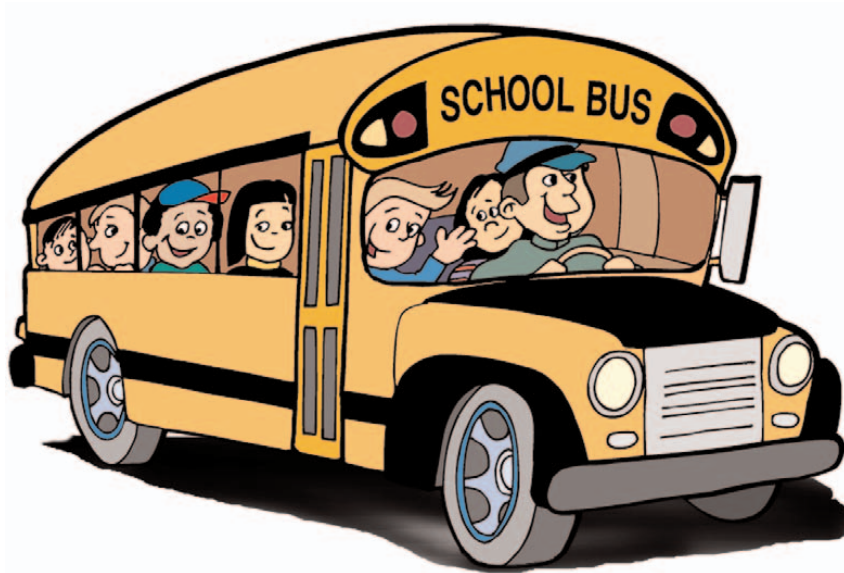


# Teacher's Guide

A Companion Resource For

## How Ice Cream Is Made: Video Field Trip



Produced By:

**PBS 39**   
WFWA-DT ■ FORT WAYNE

Graciously Underwritten By:



# Set the Stage for Learning

## Summary of the Video Field Trip

PBS39 is proud to present Video Field Trips. This free, convenient and safe venture takes place from the comfort of your classroom. Each Video Field Trip transports your class to a different venue, a place you might not be able to visit otherwise.

Learning how something is made is an important lesson in itself. With Video Field Trips, students will also see how the subjects they are learning in school, such as math, reading and science, are used in the workplace. The importance of planning, following directions, completing each step in a process, and working until a goal is reached are also demonstrated. Additionally, seeing what it takes to create a final product may help dispel the perception that all desires can be effortlessly and instantaneously satisfied.

Due to monetary and safety concerns the opportunities for traditional field trips are diminishing. Even when traditional field trips are still available, there are several advantages to going on a Video Field Trip. One is the ability to stop the video and ask students to predict what will happen next or to review the events that have occurred. You can replay a segment and direct students' attention to a specific area and reinforce a concept with an activity. For older students, videos can be used to teach note-taking skills. Students take notes on the first viewing and check them on the replay. Another advantage is that students can watch the video repeatedly during independent study, gathering information for reports or speeches. Video Field Trips offer a marvelous vehicle for learning.

The accompanying teacher's guide is based upon national education standards and provides a variety of learning activities for students in kindergarten through eighth grade. Primary grade activities are written for students in kindergarten through second grade and intermediate are grades three through five. Middle school includes grades six through eight. Patterns have been provided for your convenience.

The teacher's guide has been written by author and educator, Cathy Falk. She holds a Masters Degree from Purdue University and has taught at levels from preschool through college. She is presently a teacher to teachers, working in an urban school district as a facilitator. Cathy has been published by Creative Teaching Press, Legacy, Standard Publishing, Gospel Light, Shining Star Publications, and others.

Feel free to share ideas you have used in your classroom with us. Contact PBS39 at [www.wfwa.org](http://www.wfwa.org).

# Introducing the Subject

Today's Video Field Trip takes you inside an ice cream factory.

In this 14-minute video you will watch as farm-fresh milk is churned into ice cream, packaged, then loaded into a refrigerated truck for delivery. The entire production process takes 8 to 12 hours from the incoming milk tanker to loading ice cream in the refrigerated warehouse.

An assessment piece is included that is designed to be given to students before and after watching the video. Not only will it indicate what students have learned by viewing, it will cue them what to watch for in the video.

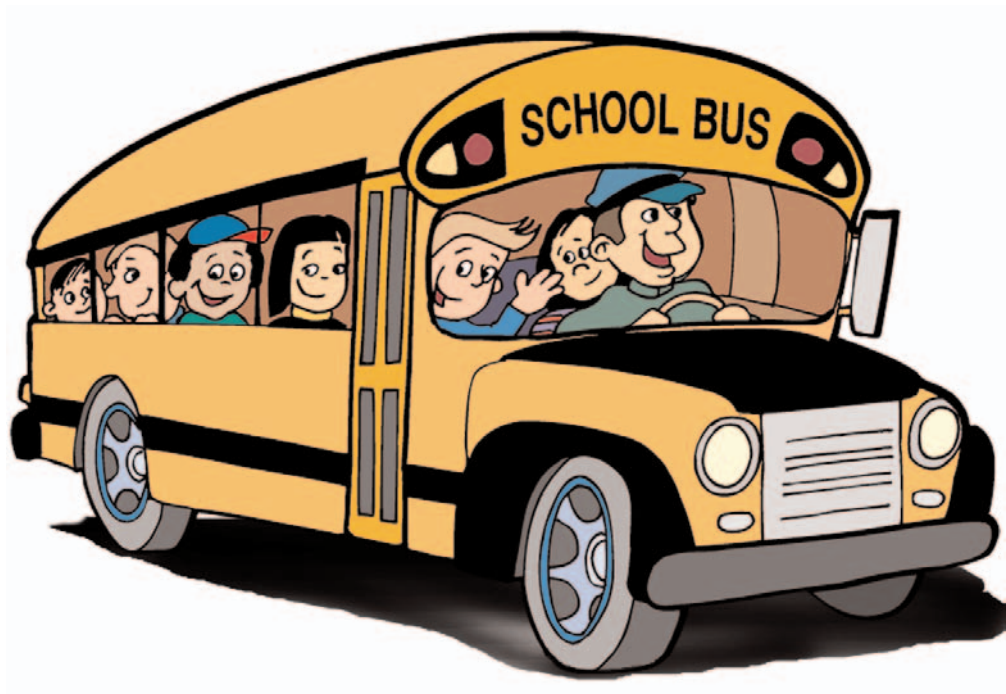
There are also 5 one-minute ice cream facts at the end of the Video Field Trip. These facts are designed to focus on a particular process that the ice cream goes through. These clips also have suggested activities to go with them and are nice to use if time is limited. The activities for each one-minute segment can be found at the very end of the teachers guide.

Before the Video Field Trip engage students with questions such as:

- How many people like ice cream?
- What is your favorite flavor?
- Who can tell us the main ingredient in ice cream?
- Have you ever made ice cream at home?

# Teacher's Guide

## Easier Assessment



Name \_\_\_\_\_

## What do you know about Ice Cream?

Before  
Assessment

After  
Assessment

- |   |   |  |   |   |
|---|---|--|---|---|
| T | F | 1. The main ingredient of ice cream is milk.   | T | F |
| T | F | 2. Butterfat is an important ingredient in ice cream.  | T | F |
| T | F | 3. Ingredients for ice cream come from all over the world.   | T | F |
| T | F | 4. Workers wear gloves while making ice cream.   | T | F |
| T | F | 5. Ice cream is heated or pasteurized to kill germs.   | T | F |
| T | F | 6. There is a different recipe for each flavor of ice cream.   | T | F |
| T | F | 7. You need math skills to make ice cream.   | T | F |
| T | F | 8. Ice cream is put in trays and frozen solid.   | T | F |
| T | F | 9. Ice cream freezes quicker at the factory than at home.  | T | F |
| T | F | 10. Chunky ingredients like chips, nuts and cookies are the last things added before the cartons are filled. | T | F |
| T | F | 11. Every carton of ice cream is tasted for quality.   | T | F |
| T | F | 12. After cartons are filled with ice cream they go straight to the delivery trucks.                         | T | F |

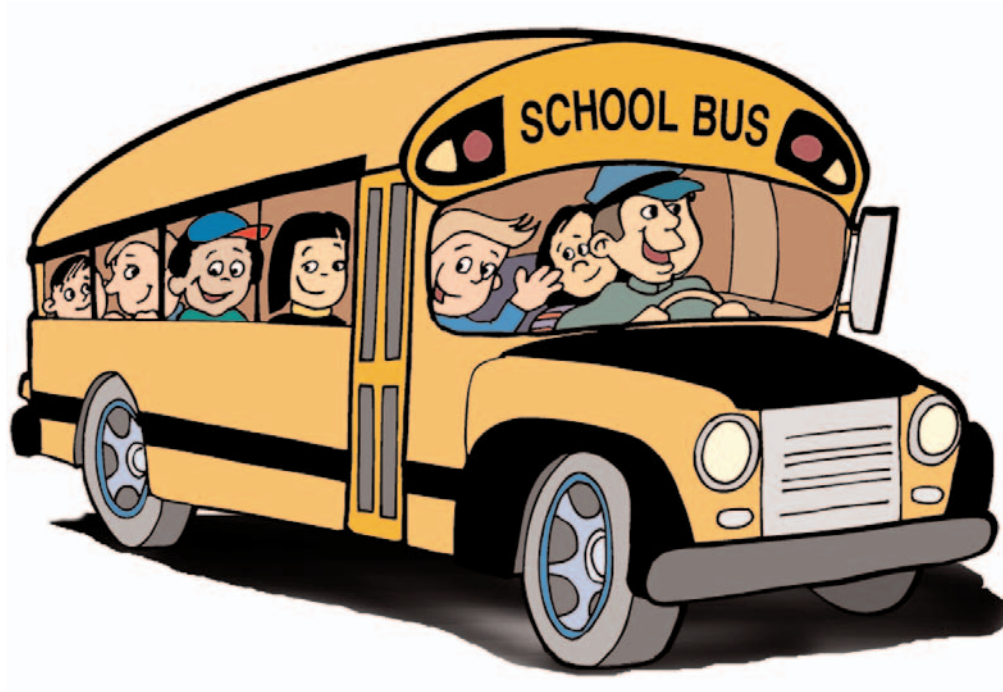


# ICE CREAM

## Easier Assessment Answer Key

1. TRUE
2. TRUE
3. TRUE
4. FALSE
5. TRUE
6. FALSE
7. TRUE
8. FALSE
9. TRUE
10. TRUE
11. FALSE
12. FALSE

# Teacher's Guide Challenging Assessment



Name \_\_\_\_\_

## What do you know about Ice Cream?

Before Assessment

After Assessment

- |   |   |   |   |   |
|---|---|---|---|---|
| T | F | 1. Milk, the main ingredient in ice cream, has more fat than cream.                           | T | F |
| T | F | 2. Butterfat is an important ingredient in ice cream.   | T | F |
| T | F | 3. Whole milk contains 4% fat.  | T | F |
| T | F | 4. One flavoring for ice cream comes from Madagascar.   | T | F |
| T | F | 5. Ice cream mix is pasteurized before it is frozen.  | T | F |
| T | F | 6. Homogenization is the process that kills harmful bacteria.                                 | T | F |
| T | F | 7. Approximately 50% of the volume of ice cream is water.                                     | T | F |
| T | F | 8. Ice cream is frozen at 32 degrees.   | T | F |
| T | F | 9. The same base batch or mix is used for chocolate chip and almond praline.                  | T | F |
| T | F | 10. Huge fans are used to keep the temperature in the enormous freezer from getting too cold. | T | F |
| T | F | 11. The density of every carton of ice cream is checked.                                      | T | F |
| T | F | 12. The filling machine operates continuously producing 2,000 gallons per hour.               | T | F |



# Challenging Assessment Answer Key

1. FALSE
2. TRUE
3. TRUE
4. TRUE
5. TRUE
6. FALSE
7. FALSE
8. FALSE
9. TRUE
10. FALSE
11. TRUE
12. TRUE

# Five Scoops of Ice Cream

**SUBJECT:**  
Language Arts  
Math

**GRADE:**  
Primary

## BRIEF DESCRIPTION

Through the simple math described in this verse, students will be developing phonemic awareness and auditory memory.

## KEY WORDS

scoops, sitting, on, cone, fell, off

## MATERIALS:

Felt, transparency, or paper representations of an ice cream cone

Felt, transparency, or paper representations of 5 separate scoops of ice cream

## PROCEDURE:

Display ice cream cone with five individual scoops of ice cream on top.

Teach the poem and then encourage students to say it with you. Remove one scoop on each verse.

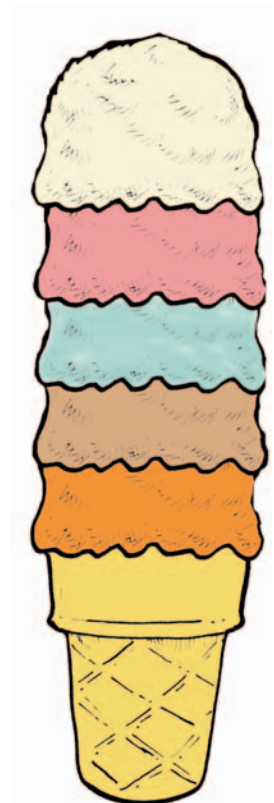
5 scoops of ice cream sitting on a cone.  
One fell off and then there were 4.

4 scoops of ice cream sitting on a cone.  
One fell off and then there were 3.

3 scoops of ice cream sitting on a cone.  
One fell off and then there were 2.

2 scoops of ice cream sitting on a cone.  
One fell off and then there was 1.

1 scoop of ice cream sitting on a cone.  
It fell off and then there was none.



# Making a Banana Split (Order Words)

**SUBJECT:**  
Language Arts

**GRADE:**  
Primary  
Intermediate

**BRIEF DESCRIPTION:**

Students will observe the assembly of a banana split and then make one of their own followed by a shared or interactive writing of a “how to” piece.

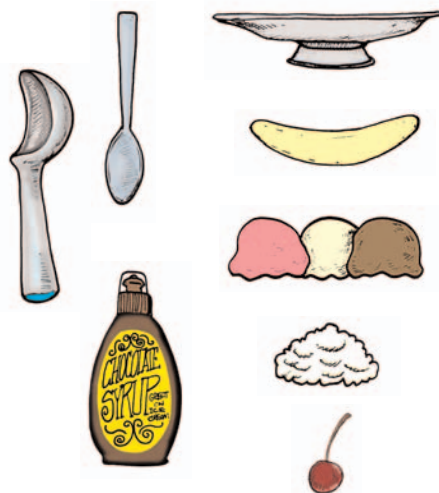
**KEY WORDS:**

banana, ice cream, scoop, syrup, topping, whipped cream, cherry, first, second, third, next, then, lastly, slice, drizzle, sprinkle, squirt

**MATERIALS:**

(Actual ingredients for a banana split or paper representations)

- Dish
- Spoon
- Scoop
- Banana
- Ice Cream
- Syrup
- Toppings
- Whipped cream
- Cherry



**PROCEDURE:**

Demonstrate the assembly of a banana split using time order words. “First, you take a dish. Second, you slice a banana and put it in the dish. Next, you add scoops of ice cream. Then, you drizzle on syrup and sprinkle on a topping. After that, you squirt on whipped cream. Lastly, you place a cherry on top.”

Allow students to assemble their own banana splits.

Use shared or interactive writing to make a “how-to chart” describing the process. If you prefer, students can draw and/or write a “how-to” piece independently or with a partner.

Older students may want to write how to make a different ice cream creation.

# Graph Favorite Flavors

## SUBJECT:

Math

## GRADE:

Primary

Intermediate

## BRIEF DESCRIPTION:

Teacher will produce a graph illustrating the distribution of students' favorite flavors of ice cream.

## KEY WORDS:

favorite, most, more, least, same, different, percentage

## MATERIALS:

- Blank graph drawn on chart paper
- Individual pieces of scoop-shaped paper, one per student
- Paper ice cream cones
- Crayons, markers or colored pencils



## PROCEDURE:

Ask students to color the scoop-shaped paper the same color as their favorite flavor of ice cream.

Begin adding the students' favorite flavors to the graph. Stack like-flavors on top of each other.

Count the number of scoops in each column and record the number below, perhaps on a cone-shaped piece of paper.

Label the blank graph with numbers on the left and flavors across the bottom.

Discuss which flavor most students like. Calculate the percentage of students that listed vanilla as their favorite flavor. What percentage liked ice cream with nuts? How many students named vanilla or chocolate as their favorite?

# Which Will Melt First?

## SUBJECT:

Science

## GRADE:

Primary

Intermediate

## BRIEF DESCRIPTION:

Students will observe the effects of temperature on the speed at which ice cream melts.

## KEY WORDS:

equal, temperature, container, freeze, cold, colder, record, time

## MATERIALS:

2 containers  
Ice cream scoop  
Ice cream  
Clock or watch  
Scale, if available



## PROCEDURE:

Put the same size scoop of ice cream in each container. If you have access to a scale, weigh the ice cream. First weigh each of the empty containers then add the ice cream and weigh again making sure there is an equal weight of ice cream in each container.

Set one container in a sunny spot (inside or out) and the second in a refrigerator (not the freezer). Record the time.

Ask students if the ice cream will melt in the refrigerator. Ask if it will melt sitting out. Have students predict which will melt first. Discuss the relationship between temperature and speed at which ice cream will melt. Are there other factors that would affect melting? (wind).

Check to see which one melts first.

Note the time.

Continue to observe the ice cream in the refrigerator and note the time it takes to melt.

# What Effect does Wind Have on Temperature?

## SUBJECT:

Science

## GRADE:

Intermediate  
Middle School

## BRIEF DESCRIPTION:

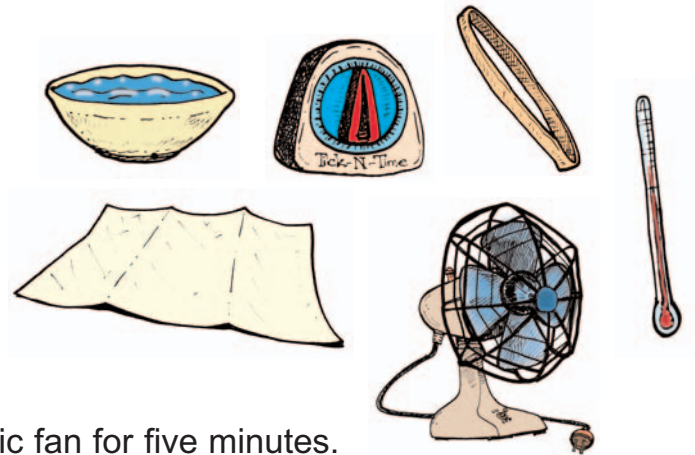
Students will observe the effects of wind on temperature.

## KEY WORDS:

equal, temperature, colder, record

## MATERIALS:

Waterproof thermometer  
Electric fan  
Timer  
Bowl of water  
Rubber band  
Paper towel



## PROCEDURE:

Put a thermometer in front of an electric fan for five minutes.

Check the temperature.

Turn off the fan and wait five minutes to give the thermometer time to change then check it again. Is there a difference? Why or why not?

Next, put the thermometer in the bowl of water and record the temperature. Remove the thermometer from the water and watch the temperature as the thermometer dries.

Wrap a wet paper towel around the bulb of the thermometer and hold it in place with a rubber band. What happens? What happens if you use a fan to blow air across the wet thermometer?

Based on your observations, why do you think there are fans inside the frozen warehouse at the ice cream factory?

# A, B, C Ice Cream

**SUBJECT:**  
Language Arts

**GRADE:**  
Primary  
Intermediate

## **BRIEF DESCRIPTION:**

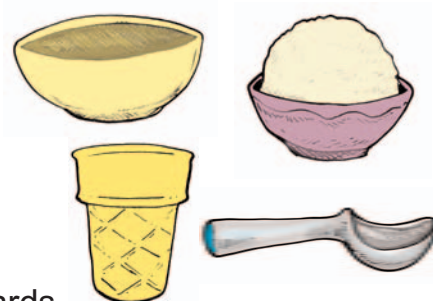
Students will listen to Shel Silverstein's poem "Eighteen Flavors" from Where the Sidewalk Ends then alphabetize a list of ice cream flavors.

## **KEY WORDS:**

chocolate, vanilla, strawberry, mint chocolate chip, orange sherbet, lime, butter pecan, bubble gum, neapolitan, banana, rocky road, cookies and cream, pumpkin, almond fudge, cherry, raspberry

## **MATERIALS:**

Index cards or stiff paper  
Shel Silverstein's poem, "Eighteen Flavors."  
Ice cream, scoop, cone, large clean bowl,  
individual bowls and spoons, optional.



## **PROCEDURE:**

Print a different flavor of ice cream on several index cards.  
Choose the number of flavors that your students are able to alphabetize. This activity can be used in a center or with the whole class.

Read "Eighteen Flavors" by Shel Silverstein from Where the Sidewalk Ends.

Eighteen luscious, scrumptious flavors –  
Chocolate, lime, and cherry,  
Coffee, pumpkin, fudge-banana,  
Caramel cream and boysenberry,  
Rocky road and toasted almond,  
Butterscotch, vanilla dip,  
Butter brickle, apple ripple,  
Coconut and mocha chip,  
Brandy peach and lemon custard,  
Each scoop lovely, smooth, and round,  
Tallest ice-cream cone in town,  
Lying there "sniff" on the ground.



For a whole class activity divide an 8 1/2" x 11" piece of paper into large rectangles and print one flavor of ice cream in each rectangle. Students cut the rectangles apart. Then put the cards in alphabetical order.

Provide an alphabetized list for self-correction.

Extend the activity by asking students to predict how many scoops of ice cream you can stack on a cone before it topples. Count as you add each new scoop of ice cream to the cone. Be sure to conduct the activity above a large, clean bowl so that the toppled ice cream can be served to the class.

# Ice Cream Shoppe

**SUBJECT:**  
Math

**GRADE:**  
Primary  
Intermediate

**BRIEF DESCRIPTION:**

Students can act out the roles of an ice cream shoppe: customer, clerk and cashier.

**KEY WORDS:**

order, clerk, change, bill, add, subtract

**MATERIALS:**

- Menus with ice cream creations and prices
- Play money
- Order forms
- Pencils



**PROCEDURE:**

Ask small groups of students to design and write menus for an ice cream shoppe. This could be done by hand or on the computer. Be sure that prices are included for each item. The menu might include cones, cups, sundaes, shakes, sodas, and banana splits.

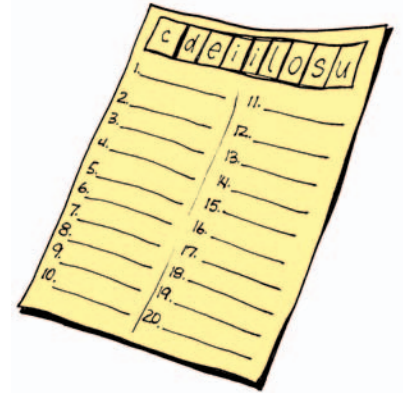
Students choose one role: customer, clerk or cashier. Add interest to the activity with props and realistic order forms.

The customers read the menu, place their orders and pay for the ice cream. Clerks write down the order and tally the bill. The cashier checks the math on the bill, accepts payment and makes change.

Vary the difficulty of this activity by pricing the items on the menu in odd amounts. For example, an easy calculation would be \$1 per scoop of ice cream. A price of \$1.17 would be more difficult to add and make change.

An alternate way to conduct the activity is to have students write story problems using prices on the menus.

# Word Puzzle



**SUBJECT:**  
Language Arts

**GRADE:**  
Primary  
Intermediate

**BRIEF DESCRIPTION:**

Students manipulate individual letter cards to create as many different words as possible.

**KEY WORDS:**

clod, clods, close, closed, cloud, clouds, clue, clued, clues, cod, code, codes, coil, coiled, coils, cold, colds, coleus, could, cud, cue, cued, cues, deuce, dice, die, dies, disc, do, docile, doe, does, doilies, dose, douse, duce, due, duel, duels, dues, duo, I, ice, iced, ices, idle, idles, idol, idols, is, isle, led, lei, leis, lice, lid, lids, lie, lied, lies, lode, lose, loud, louse, lucid, ode, odes, oil, oiled, oils, old, scold, scud, side, silo, sled, slice, sliced, slid, slide, so, sod, soil, soiled, sold, sole, solid, soul, sue, sued, us, use, used

**MATERIALS:**

Individual letters of “delicious” printed on separate cards

**PROCEDURE:**

Make a paper for the students by using the “table” tool on a word processing program to create letterboxes. Choose a large, easy-to-read font. The 1-row table should look something like this:

c	d	e	i	i	l	o	s	u
---	---	---	---	---	---	---	---	---

Note: The letters are in alphabetical order.

On the same student paper, you can add numbered lines below the table for the answers.

Students will cut out the letters and manipulate them to form as many new words as they can. You may wish to give each student a strip of felt to help keep letters in place. Students may only use the letters in the boxes. No additional letters may be added. The words can be written on the remaining piece of paper.

The only word that can be formed using all the letters is “delicious.” You might give a clue for this bonus word like, “How does ice cream taste?”

The words that can be made from the letters in delicious are listed above as “Key Words.”

# Making Ice Cream

## SUBJECT:

Math  
Science

## GRADE:

Primary  
Intermediate

## BRIEF DESCRIPTION:

Students will make ice cream with a partner. It takes about two minutes in the freezer at the factory for the mix to freeze. How long will it take your ice cream?

## KEY WORDS:

mix, shake, roll, mixture, freeze, frozen, tightly, secure, tape, hard

## INGREDIENTS:

(1 batch for every 2-3 students)

### VANILLA ICE CREAM:

- 1/2 cup whipping cream
- 1/2 cup whole milk
- 1/4 cup sugar
- 1/2 teaspoon vanilla extract

...OR...

### CHOCOLATE ICE CREAM:

- 1/2 cup whipping cream
- 1/2 cup whole milk
- 1/4 cup sugar
- 2 tablespoons cocoa
- 1/4 tsp. vanilla extract
- 1/8 tsp. salt

## MATERIALS (PER BATCH)

- 1 - 11.5 ounce coffee can with plastic lid
- 1 - 39 ounce coffee can with plastic lid
- Duct tape
- Salt (rock or table)
- Crushed ice, about 1 pound per student
- Measuring spoons and cups
- Newspapers or towels to cover area
- Sponge to clean off the smaller can
- Gloves
- Spoons and small bowls



# Making Ice Cream (Continued)

## PROCEDURE:

Put ingredients into the smaller can and close the lid tightly. Secure with duct tape.

Put the smaller can in the center of the larger can. Pack ice all around the smaller can so it is snugly set. Sprinkle about 2 tablespoons of salt on the ice. Put lid on the larger can and secure with duct tape.

Shake or roll the cans on towels or newspapers about 20 minutes until the mix freezes. Students will want to wear gloves. If the mixture has not thickened in that length of time, drain excess water from the larger can and add more ice and salt. Shake or roll another 10 minutes or so. Dump ice and water. To keep any salty water from entering the ice cream, wipe the lid of the can before opening it.

The final step in making ice cream is called “hardening.” The ice cream is put in a freezer to get harder. It is fine for the students to eat the ice cream before it has completely hardened. It will be like soft-serve.

Discuss how the mixture has changed from one form to another (liquid to solid). Can it change again? If so, how? (By melting)

Introduce the scientific method by asking a question. What would happen if you don't shake or roll the can? (It will be hard, not smooth and creamy.) State a hypothesis: “Ice cream that is put into the freezer without shaking or rolling will be the same as ice cream that freezes while being shook or rolled.”

Next conduct the experiment. Freeze one batch of the mixture without shaking it. Freeze a second one while shaking. Examine the results. Were you able to prove or disprove the hypothesis?

Ask students for possible explanations as to why the first one is harder and not as smooth. The answer is shaking (rolling, stirring, mixing) not only blends the ingredients, it brings warmer ingredients in the middle into contact with the cold outside, speeding up the freezing process. The motion while freezing breaks up the ice crystals making the ice cream smoother. It also creates tiny air bubbles. The air makes the ice cream soft and light. Approximately one-half of the volume of ice cream is air!

A second question might be, “What would happen if you do not add salt to the ice?” (The mixture will not freeze.) The hypothesis might be stated as, “Salt will speed the freezing process.” The salt is added to the ice because it lowers the temperature of the ice in the can. The temperature of melting ice is 32 degrees. Adding salt pushes the temperature of melting ice below 10 degrees, a temperature at which the mixture can freeze.

# Five Senses

**SUBJECT:**

Health  
Language Arts

**GRADE:**

Intermediate

**BRIEF DESCRIPTION:**

Students will use their five senses to create a web describing ice cream.

**KEY WORDS:**

ice cream, senses, sight, hearing, taste, touch, smell

**MATERIALS:**

Paper  
Pencils



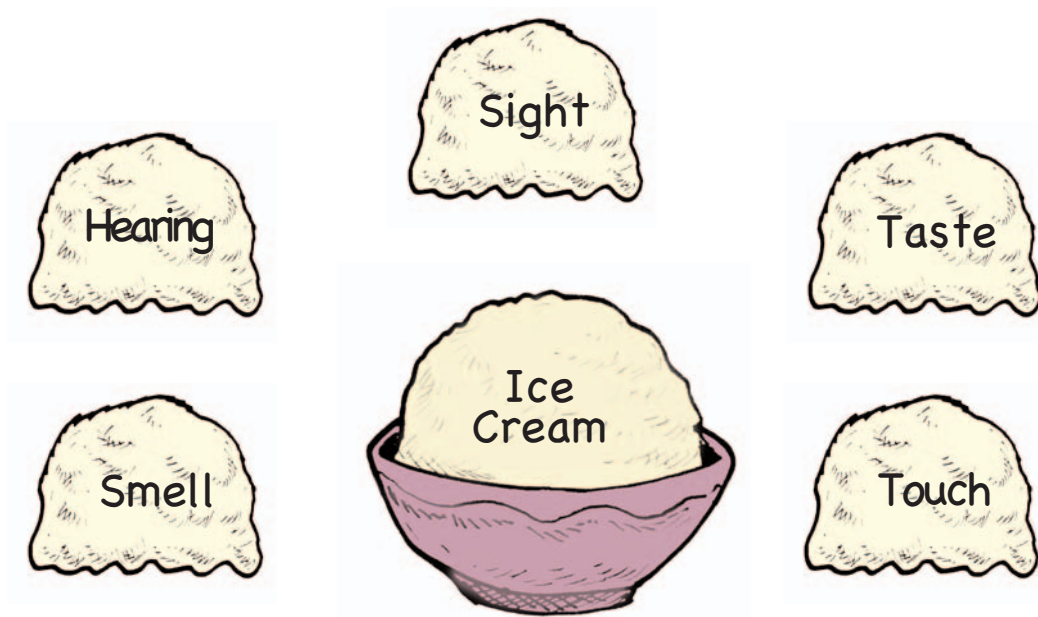
**PROCEDURE:**

Review the five senses with the students.

Ask students to create a web with one bowl of ice cream in the center of the page and five scoops surrounding it.

Label the bowl in the center “Ice Cream” and print one sense in each of the remaining five scoops.

Have students write words or phrases describing ice cream for each of five the senses.  
Ask students to write a descriptive paragraph about ice cream.



# Ice Cream Acrostic

**SUBJECT:**  
Language Arts

**GRADE:**  
Intermediate  
Middle

**BRIEF DESCRIPTION:**

Students write an acrostic using the name of their favorite flavor of ice cream as the strategic word.

**KEY WORDS:**

acrostic, favorite, flavor, vertical, phrase, describe

**MATERIALS:**

Paper  
Pencils



**PROCEDURE:**

Ask students to choose their favorite flavor of ice cream.

Write the flavor vertically on a piece of paper.

Students write a word or a phrase that describes eating ice cream with each letter in the flavor as the first letter in the describing word.

To make the task more challenging, have the entire group of words or phrases tell a story.

**V**ery good  
**A**wesome  
**N**ourishing  
**I**cy  
**L**uscious  
**L**ovely  
**A**fter dinner treat

To make it easier, the letter in the acrostic can be found anywhere in the describing word without forming a message or phrase.

**c**old  
**s**mooth  
**w**onderful  
**c**olorful  
**s**oft  
**d**electable  
**t**asty  
**s**weet  
**d**elicious

# Track the Ingredients

**SUBJECT:**  
Social Studies

**GRADE:**  
Intermediate  
Middle School

**BRIEF DESCRIPTION:**  
Students will locate the source of various ingredients of ice cream on a world map.

**KEY WORDS:**  
ingredients, product, Madagascar, South America, Georgia, Chicago

**MATERIALS:**  
World map  
Markers or colored pencils



The ingredients for ice cream come from all over the world. Put an “x” on the map for each place listed below. Write the name of the ingredient or product below the “x”.

Cocoa powder from South America  
Vanilla from Madagascar, off the southeast coast of Africa  
Corn syrup from Chicago  
Cookies from Illinois  
Pecans from Georgia  
Almonds from California  
Paper cartons from New York, Kansas and California

## ADAPTATION FOR PRIMARY STUDENTS

**MATERIALS:**  
Rectangles cut from blue and yellow construction paper

Give each student one blue and one yellow piece of construction paper 6” square.

Teacher uses a world map and shows the origin of the ingredients. If the ingredients come from the U.S., students hold up the blue paper. If they are from another country, students hold up the yellow paper. Everyone is to respond at the same time.

# How Ice Cream Was Discovered

**SUBJECT:**  
Language Arts

**GRADE:**  
Intermediate  
Middle School

**BRIEF DESCRIPTION:**  
Students will write a creative piece on how ice cream was discovered.

**KEY WORDS:**  
imaginative, humorous, persuasive, fantasy, folktale, tall tale, make-believe

**MATERIALS:**  
Paper  
Pencils

**PROCEDURE:**  
Introduce the genres of fantasy, folktale and make-believe by reading suitable titles.



Ask students to write an imaginative explanation of how ice cream was invented or discovered. The piece can be a fantasy, folktale, tall tale or humorous.

# The Top Ten

**SUBJECT:**  
Language Arts

**GRADE:**  
Intermediate  
Middle School

**BRIEF DESCRIPTION:**  
Students will list 10 reasons ice cream makes the best dessert.

**KEY WORDS:**  
humorous, persuasive, prioritize, reverse

**MATERIALS:**  
Paper  
Pencils

**PROCEDURE:**

Students can work individually or in groups of 2 or 3 to create a list of 10 reasons ice cream is the best dessert.

The list should be written in reverse order with the best reason listed last and labeled as #1.

The list can be humorous or persuasive.



# How Many Scoops?

**SUBJECT:**  
Math

**GRADE:**  
Intermediate  
Middle School

**BRIEF DESCRIPTION:**

Students will calculate the ingredient amounts needed to convert a tanker truck of milk into ice cream.

**KEY WORDS:**

gallons, half gallons, quarts, pints, pounds, ounces

**MATERIALS:**

Paper  
Pencils



**PROCEDURE:**

Students are given the following problems.

They can work alone or with a partner to calculate the results.

- One tanker holds 5,000 gallons of milk.
  - It takes 1.5 gallons of milk to make a gallon of ice cream.
  - There are approximately 30 scoops of ice cream in a gallon.
  - A gallon of ice cream weighs 4.5 pounds.
- ? How many gallons of ice cream can a tanker of milk make? How many scoops?
- ? If you ate 2 scoops of ice cream every day, how many gallons of ice cream would you have to have in the freezer for a year's supply?
- ? If a half-gallon of ice cream costs \$5.00, how much does the ice cream cost in a triple scoop cone?
- ? How much would a quart of ice cream weigh? How many fractions of a pound does a single scoop of ice cream weigh?
- ? Six people want to divide a gallon of ice cream equally. How many scoops would each person get?

Ask each student or group to generate a math question based on the information given.

# What is Density?

**SUBJECT:**

Science

**GRADE:**

Primary

Intermediate

**BRIEF DESCRIPTION:**

Students will discover that ice and water have different density.

**KEY WORDS:**

density, ice, melt, water, oil, less, more, frozen

**MATERIALS:**

Clear drinking glass

Vegetable oil

Colored water frozen into a cube



**PROCEDURE:**

Pour the oil into the glass.

Ask students to predict if the ice cube will sink or float in the oil.

(It will float.)

Do they know why?

(The ice contains frozen air bubbles which make it less dense than the oil.)

Drop the ice cube into the glass. Leave the glass alone while the ice melts. What has happened?

(The ice melted, releasing the air bubble and now the water is more dense than the oil so the water settles on the bottom.)

(A plain ice cube works just as well but the color makes it easier for students to see what happens to the water.)

# Which is More Dense?

## SUBJECT:

Science

## GRADE:

Middle School

## BRIEF DESCRIPTION:

Students will discover that salt water and water have different density.

## KEY WORDS:

density, mass, volume, sink, float

## MATERIALS:

2 Clear jars or bowls capable of holding more than 32 ounces

1/4 cup of salt

Water

Raw egg

Slotted spoon



## PROCEDURE:

Measure 32 ounces (4 cups) of water into each jar or bowl.

Stir in 1/4 cup of table salt into 1 bowl of water until it is dissolved.

Gently lower the raw egg into the plain water. What happens? (It sinks.)

Take the same egg and lower it into the salty water. What happens? (It floats.)

Ask students to explain the difference.

(The egg is less dense than the salt water but more dense than fresh water. Density is the amount of mass an object has compared to its volume.)

# The Role of Pasteurization

**SUBJECT:**

Science

Math

**GRADE:**

Middle School

**BRIEF DESCRIPTION:**

Students will conduct an experiment to learn the effects of pasteurization on bacteria.

**KEY WORDS:**

pasteurization, bacteria, germs, harmful

**MATERIALS:**

See web site

**PROCEDURE:**

Pasteurization is a process which is designed to kill bacteria. At the factory, the ice cream mix is heated to 170-180 degrees for one minute and quickly cooled.



Go to <http://www.uen.org/Lessonplan/preview.cgi?LPid=2516> for a microbe experiment on sour milk.

# Germs are Everywhere

## SUBJECT:

Science  
Health

## GRADE:

Primary  
Intermediate

## BRIEF DESCRIPTION:

Students will experience how germs are spread through this simulation.

## KEY WORDS:

bacteria, germs, harmful, contact, spread

## MATERIALS:

Pencil  
White school glue  
Glitter



## PROCEDURE:

Before class, apply glue to the pencil then sprinkle with glitter.

Pass the pencil around the room. As students handle the pencil, ask if they can tell what color it was before you added the glitter.

After everyone has touched the pencil, ask them to look at their hands. In addition, where else can they find glitter?

Explain that germs are spread in a similar way.

Afterwards, have everyone wash their hands with soap and water.

Talk about how important it is to control the germs or bacteria in things we eat and the steps a food production plant must take to ensure cleanliness.

# Annotated Book List

Books can be read aloud in the primary grades and read independently by intermediate students. Students can keep a book log using a teacher-created form, if you wish. Potential information might include title, author, illustrator, topic, genre and student's favorite part.

## Nonfiction

**FROM COW TO ICE CREAM BY BERTRAM T. KNIGHT,  
CHILDREN'S PRESS, 1997, 32 PAGES.**

This photo essay uses clear, colorful photographs and descriptive text to walk students through the steps of ice cream production in a modern factory. This is an excellent resource for elementary children.

**I LIKE ICE CREAM BY ROBIN PICKERING,  
CHILDREN'S PRESS, 2000, 24 PAGES.**

How do you like to eat ice cream? This easy-to-read book gives a brief description of how ice cream is made and the various ways it can be served. This is an emergent level book.

**ICE CREAM BY ELISHA COOPER,  
GREENWILLOW BOOKS, 2002, 40 PAGES.**

The cartoon-style illustrations of this informative book depict how ice cream is made. The text begins with cows in the field and ends with an ice cream truck making a delivery to the very farmer who tends them. The book gives a thorough explanation yet moves at a good pace. Elementary students will find the creative placement of text engaging.

**MILK TO ICE CREAM BY INEZ SNYDER,  
CHILDREN'S PRESS, 2003, 24 PAGES.**

A boy and his father make ice cream at home using a recipe that must be cooked. This book with its large print, minimal text and clear pictures is suitable for first graders to read alone.

**WE ALL SCREAM FOR ICE CREAM!, BY LEE WARDLAW,  
HARPERCOLLINS PUBLISHER, 2000, 216 PAGES.**

Intermediate and Middle High School students who want to learn about the history of ice cream will want to read this book. The book traces the creation of ice cream back to the T'ang Dynasty in China and weaves anecdotal stories with facts for an enjoyable read.



# Fiction

**CURIOUS GEORGE GOES TO AN ICE CREAM SHOP**  
EDITED BY MARGRET REY AND ALAN J. SHALLELCK, HOUGHTON MIFFLIN  
COMPANY, 1999, 32 PAGES.

George attracts a crowd by making a banana split in the window of a new ice cream store.

**ICE CREAM BEAR BY JEZ ALBOROUGH,**  
CANDLEWICK PRESS, 1989, 32 PAGES.

Ice Cream Bear is a polar bear who dreams it is snowing ice cream. This delightful book is written in rhyme and is accompanied by vivid illustrations. It is a great book to read aloud to a class of children because they will enjoy completing the rhymes.

**ICE CREAM NEXT SUMMER BY ELAINE GOVERN,**  
ALBERT WHITMAN & COMPANY, 1973, 40 PAGES.

Check your public library for this out-of-print book that explains how ice cream was made before refrigeration. Through a fictitious story line and photographs children learn that blocks of ice were cut from the river in winter, covered in sawdust, and stored until summer to make ice cream.

**THE ICE CREAM SCOOP BY CAROLYN KEENE,**  
SIMON AND SCHUSTER, 1995, 74 PAGES.

*The Ice Cream Scoop* is book number 6 in the *Nancy Drew Notebooks* "Ready-for-Chapters" book series. Embedded in this beginning chapter book is a brief but accurate description of how ice cream is made. The mystery gives a glimpse of what it is like to run an ice cream parlor. Three girlfriends have to write a report for school on their favorite food. During their research they learn there is trouble at one of the stores in town.

**THE SUNDAE SCOOP BY STUART J. MURPHY,**  
HARPERCOLLINS PUBLISHERS, 2003, 34 PAGES.

Children planning for the school picnic calculate how many different sundae combinations can be made with two ice creams, two syrups and two toppings. The storyline and illustrations help elementary students to understand one functional use of math.



# Relevant Web Sites

The *Arthur* page at **pbskids.org** contains a game called “Scoop.” Students predict which ice cream creation a character will want, read the recipe and build the cone. If they follow the directions correctly, the customer leaves a tip.

<http://pbskids.org>

Create additional word puzzles with this site. It will generate a list of every possible word that can be made using the letters of a word.

<http://www.wordless.com/getwordsinwords.com.asp>

Ice Cream Alliance of the United Kingdom has information on the history of ice cream as well as fantastic frozen facts. Click on the menu item “Info for Ice Cream Eaters”.

<http://www.ice-cream.org/home.html>

Pasteurization is the process that kills bacteria in milk. This web site contains a quiz appropriate for intermediate and middle school students on bacteria.

<http://www.nationalgeographic.com/ngkids/0010/bacteria/>

PBS’s *Anne of Green Gables: The Animated Series* has a lesson plan that correlates with Episode 11, “The Ice Cream Promise.”

<http://pbskids.org/anne/tclesson11.html>

Meet John, the ice cream taster for Dreyers at this web site.

<http://www.dreyers.com/main/taster.asp?b=104>

## Careers

If working in an ice cream factory sounds appealing, here are some jobs to explore.

- FOOD PROCESS ENGINEER
- MECHANICAL ENGINEER
- ACCOUNTANT
- ADVERTISING
- SALES
- TRUCK DRIVER

# Activities for the 5 One-Minute Ice Cream Facts Segments

1) VIDEO CLIP IS OF RECEIVING - ALL THE INGREDIENTS THAT IT TAKES TO MAKE ICE CREAM, AND WHERE THEY COME FROM.

## Track the Ingredients

**SUBJECT:**  
Social Studies

**GRADE:**  
Intermediate  
Middle School

**BRIEF DESCRIPTION:**  
Students will locate the source of various ingredients of ice cream on a world map.

**KEY WORDS:**  
ingredients, product, Madagascar, South America, Georgia, Chicago

**MATERIALS:**  
World map  
Markers or colored pencils



The ingredients for ice cream come from all over the world. Put an "x" on the map for each place listed below. Write the name of the ingredient or product below the "x".

Cocoa powder from South America  
Vanilla from Madagascar off the southeast coast of Africa  
Corn syrup from Chicago  
Cookies from Illinois  
Pecans from Georgia  
Almonds from California  
Paper cartons from New York, Kansas and California

### ADAPTATION FOR PRIMARY STUDENTS

**MATERIALS:**  
Rectangles cut from blue and yellow construction paper.

Give each student one blue and one yellow piece of construction paper 6" square.

Teacher uses a world map and shows the origin of the ingredients. If the ingredients come from the U.S., students hold up the blue paper. If they are from another country, students hold up the yellow paper. Everyone is to respond at the same time.

2) VIDEO CLIP IS OF PASTEURIZATION & HOMOGENIZATION -  
ICE CREAM IS HEATED AND "SHOT" THROUGH A VALVE AS PART OF PREP.

## The Role of Pasteurization

**SUBJECT:**

Science

Math

**GRADE:**

Middle School

**BRIEF DESCRIPTION:**

Students will conduct an experiment to learn the effects of pasteurization on bacteria.

**KEY WORDS:**

pasteurization, bacteria, germs, harmful

**MATERIALS:**

See web site

**PROCEDURE:**

Pasteurization is a process which is designed to kill bacteria. At the factory, the ice cream mix is heated to 170-180 degrees for one minute and quickly cooled.



Go to <http://www.uen.org/Lessonplan/preview.cgi?LPid=2516>  
for a microbe experiment on sour milk.

3) VIDEO CLIP IS OF FLAVORING - SHOWS HOW DIFFERENT FLAVORINGS ARE ADDED, EMPHASIZE THE MATH AND ORGANIZATION INVOLVED

## Germs are Everywhere

### SUBJECT:

Science  
Health

### GRADE:

Primary  
Intermediate

### BRIEF DESCRIPTION:

Students will experience how germs are spread through this simulation.

### KEY WORDS:

bacteria, germs, harmful, contact, spread

### MATERIALS:

Pencil  
White school glue  
Glitter



### PROCEDURE:

Before class, apply glue to the pencil then sprinkle with glitter.

Pass the pencil around the room. So that students handle the pencil, ask if they can tell what color it was before you added the glitter.

After everyone has touched the pencil, ask them to look at their hands. In addition, where else can they find glitter?

Explain that germs are spread in a similar way.

Afterwards, have everyone wash their hands with soap and water.

Talk about how important it is to control the germs or bacteria in things we eat and the steps a food production plant must take to ensure cleanliness.

# Graph Favorite Flavors

## SUBJECT:

Math

## GRADE:

Primary

Intermediate

## BRIEF DESCRIPTION:

Teacher will produce a graph illustrating the distribution of students' favorite flavors of ice cream.

## KEY WORDS:

favorite, most, more, least, same, different, percentage

## MATERIALS:

Blank graph drawn on chart paper  
Individual pieces of scoop-shaped paper,  
one per student  
Paper ice cream cones  
Crayons, markers or colored pencils



## PROCEDURE:

Ask students to color the scoop-shaped paper the same color as their favorite flavor of ice cream.

Begin adding the students' favorite flavors to the graph. Stack like-flavors on top of each other.

Count the number of scoops in each column and record the number below, perhaps on a cone-shaped piece of paper.

Label the blank graph with numbers on the left and flavors across the bottom.

Discuss which flavor most students like. Calculate the percentage of students that listed vanilla as their favorite flavor. What percentage liked ice cream with nuts? How many students named vanilla or chocolate as their favorite?

# Ice Cream Acrostic

**SUBJECT:**  
Language Arts

**GRADE:**  
Intermediate  
Middle

**BRIEF DESCRIPTION:**  
Students write an acrostic using the name of their favorite flavor of ice cream as the strategic word.

**KEY WORDS:**  
acrostic, favorite, flavor, vertical, phrase, describe

**MATERIALS:**  
Paper  
Pencils



**PROCEDURE:**  
Ask students to choose their favorite flavor of ice cream.  
Write the flavor vertically on a piece of paper.  
Students write a word or a phrase that describes eating ice cream with each letter in the flavor as the first letter in the describing word.

To make the task more challenging, have the entire group of words or phrases tell a story.

**V**ery good  
**A**wesome  
**N**ourishing  
**I**cy  
**L**uscious  
**L**ovely  
**A**fter dinner treat

To make it easier, the letter in the acrostic can be found anywhere in the describing word without forming a message or phrase.

**c**old  
**s**mooth  
**w**wonderful  
**c**olorful  
**s**oft  
**d**electable  
**t**asty  
**s**weet  
**d**elicious

4) VIDEO CLIP OF QUALITY CONTROL - ICE CREAM IS WEIGHED, CUT IN HALF, AND SENT THROUGH A METAL DETECTOR, ALL TO ENSURE CONSISTENCY

## What is Density?

### SUBJECT:

Science

### GRADE:

Primary

Intermediate

### BRIEF DESCRIPTION:

Students will discover that ice and water have different density.

### KEY WORDS:

density, ice, melt, water, oil, less, more, frozen

### MATERIALS:

Clear drinking glass

Vegetable oil

Colored water frozen into a cube



### PROCEDURE:

Pour the oil into the glass.

Ask students to predict if the ice cube will sink or float in the oil.

(It will float.)

Do they know why?

(The ice contains frozen air bubbles which make it less dense than the oil.)

Drop the ice cube into the glass. Leave the glass alone while the ice melts. What has happened?

(The ice melted, releasing the air bubble and now the water is more dense than the oil so the water settles on the bottom.)

(A plain ice cube works just as well but the color makes it easier for students to see what happens to the water.)

# Which is More Dense?

**SUBJECT:**

Science

**GRADE:**

Middle School

**BRIEF DESCRIPTION:**

Students will discover that salt water and water have different density.

**KEY WORDS:**

density, mass, volume, sink, float

**MATERIALS:**

- 2 Clear jars or bowls capable of holding more than 32 ounces
- 1/2 cup of salt
- Water
- Raw egg
- Slotted spoon



**PROCEDURE:**

Measure 32 ounces (4 cups) of water into each jar or bowl.

Stir in 1/4 cup of table salt until salt is dissolved.

Gently lower the raw egg into the plain water. What happens? (It sinks.)

Take the same egg and lower it into the salty water. What happens? (It floats.)

Ask students to explain the difference.

(The egg is less dense than the salt water, but more dense than fresh water. Density is the amount of mass an object has compared to its volume.)

5) VIDEO CLIP IS ON HARDENING - EXTREME TEMPERATURES ARE INVOLVED, COMPARISONS ARE MADE TO ARCTIC CLIMATES AND HOW LITTLE COLD THE HUMAN BODY CAN TAKE.

## Which Will Melt First?

### SUBJECT:

Science

### GRADE:

Primary

Intermediate

### BRIEF DESCRIPTION:

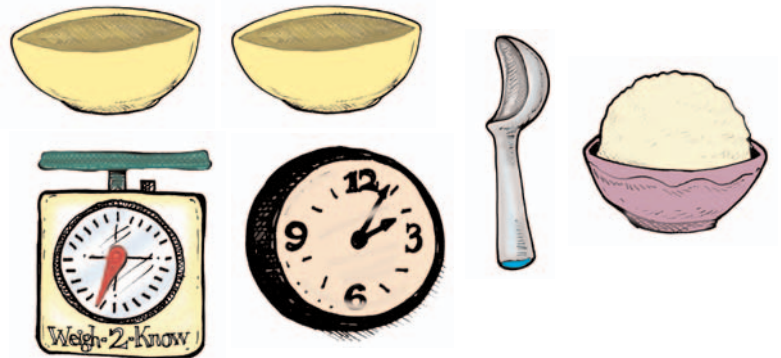
Students will observe the effects of temperature on the speed at which ice cream melts.

### KEY WORDS:

equal, temperature, container, freeze, cold, colder, record, time

### MATERIALS:

2 containers  
Ice cream scoop  
Ice cream  
Clock or watch  
Scale, if available



### PROCEDURE:

Put the same size scoop of ice cream in each container. If you have access to a scale, weigh the ice cream. First weigh each of the empty containers then add the ice cream and weigh again making sure there is an equal weight of ice cream in each container.

Set one container in a sunny spot (inside or out) and the second in a refrigerator (not the freezer). Record the time.

Ask students if the ice cream will melt in the refrigerator. Ask if it will melt sitting out. Have students predict which will melt first. Discuss the relationship between temperature and speed at which ice cream will melt. Are there other factors that would affect melting? (wind).

Check to see which one melts first.

Note the time.

Continue to observe the ice cream in the refrigerator and note the time it takes to melt.

# What Effect does Wind Have on Temperature?

## SUBJECT:

Science

## GRADE:

Intermediate  
Middle School

## BRIEF DESCRIPTION:

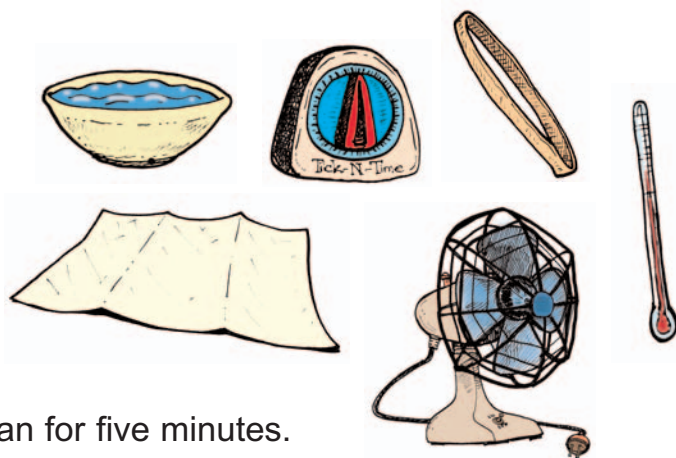
Students will observe the effects of wind on temperature.

## KEY WORDS:

equal, temperature, colder, record

## MATERIALS:

Waterproof thermometer  
Electric fan  
Timer  
Bowl of water  
Rubber band  
Paper towel



## PROCEDURE:

Put a thermometer in front of an electric fan for five minutes.

Check the temperature.

Turn off the fan and wait five minutes to give the thermometer time to change then check it again. Is there a difference? Why or why not?

Next, put the thermometer in the bowl of water and record the temperature.

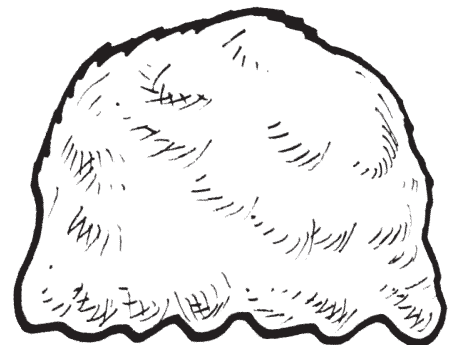
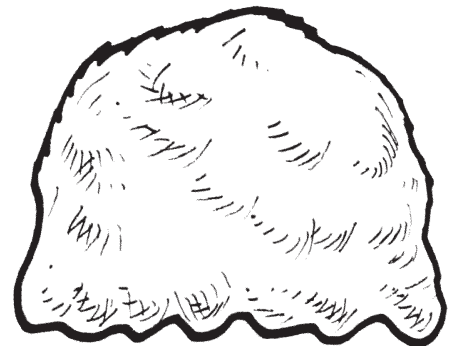
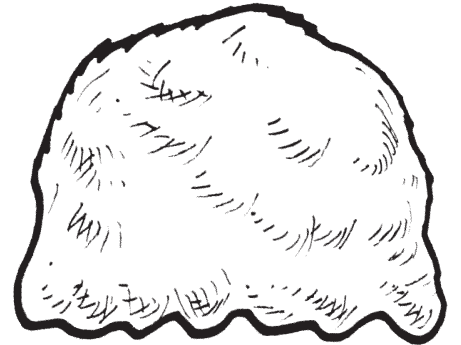
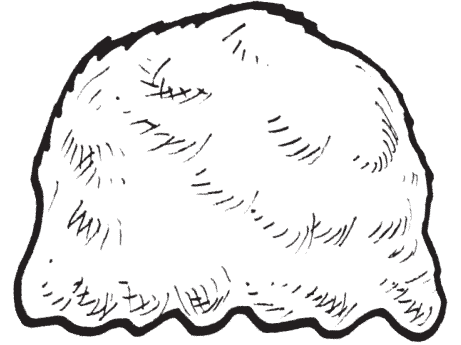
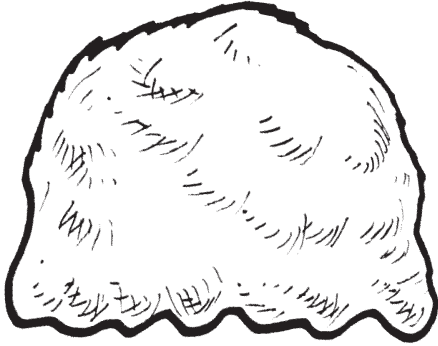
Remove the thermometer from the water and watch the temperature as the thermometer dries.

Wrap a wet paper towel around the bulb of the thermometer and hold it in place with a rubber band. What happens? What happens if you use a fan to blow air across the wet thermometer?

Based on your observations, why do you think there are fans inside the frozen warehouse at the ice cream factory?

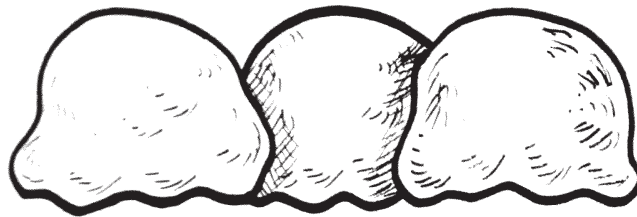
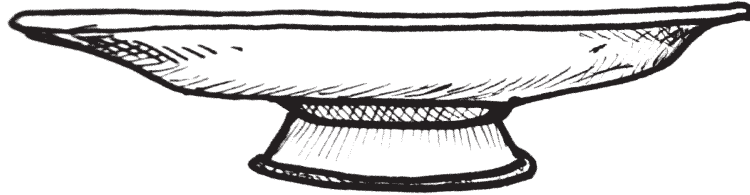
# Ice Cream Cone Clip Art

Copy, Cut and Color!



# Banana Split Clip Art

Copy, Cut and Color!



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