All scientists follow a set of steps called the scientific method. They use this method to test their ideas and see if they are correct. First, they observe the world around them. Next, they make a hypothesis, or educated guess, to explain what they see. Then they experiment to test their hypothesis. They collect and analyze data, or information. Finally, based on the data, they draw a conclusion about whether their hypothesis was correct.

Students can use the scientific method in the same way in their science lessons and experiments. In this topic, students will learn about the scientific method, how to describe their observations, how to be safe and identify equipment in a science lab and how to conduct an experiment of their own. They will also learn what food scientists do and about some interesting scientific discoveries.

**Video**
The Follow the Compass team make a video of their experiment for a science fair, post it online and decide to make a podcast every week!

**Project**
**Experiment: Classroom Science**
Students will do a safe classroom experiment to show what they have learned about the scientific method.

**Vocabulary**

**Science Nouns**
- conclusion, data, experiment, gas, hypothesis, liquid, shape, size, solid, steam

**Science Verbs**
- boil, change, condense, dissolve, evaporate, float, freeze, melt, mix, pour, sink

**Lab Equipment**
- beaker, cylinder, eyewash, gloves, lab coat, microscope, safety goggles, test tube

**Compound Nouns**
- Compound nouns are made of two nouns, the first describing the second. They can be two words (lab coat) or one (eyewash).

**Grammar**

**Present Simple for Facts**
- Present simple verbs describe actions that are repeated, that are usual or that do not change: *The sun rises in the east.* Scientists use the present simple to express scientific facts.

**Sequence Adverbs**
- Sequence adverbs tell the order of events or the steps in a process. When students are reading or writing directions, these words help them identify what steps should be done *first*, *next*, *then*, *after that* and *finally*.

**Zero Conditional**
- The zero conditional is a kind of sentence that uses *if* or *when* to describe facts, or statements about the world that are always true or possible. It has two clauses: The *if/when* clause describes a condition, and the other clause describes the result. The verbs in both clauses of a zero-conditional sentence are in the present simple: *If you put water in a freezer, it turns to ice.* The clauses can be in either order: *Water turns to ice if you put it in a freezer.*

**Reading**

**Matching Information in the Activity and Reading Text**
- By identifying the key words or phrases in a reading activity, students can find the answers in the text more easily.

**Predicting the Content of a Reading Text**
- By looking at titles, headings and pictures, students can get an idea of what a text will be about. This can help with word recognition and comprehension.

**Speaking**

**Agreeing and Disagreeing**
- Students will speculate about the freezing points of different substances, using set phrases to show agreement or disagreement.

**Showing Interest**
- By using expressions that show interest in and enthusiasm for another speaker’s point, students can convey politeness and help keep the conversation going.

**Writing**

**Writing Instructions**
- When writing instructions, such as for a science experiment, students should use imperative verbs and sequence adverbs to show the order of steps.
Objective

Students will learn about the steps in the scientific method.

Lead in to the Lesson (10 min.)

Get Students Thinking

• Establish the concept of sequence: Think of something you do every day, such as brushing your teeth. What are the steps? What happens if you do them in a different order? Does it work if you add toothpaste at the end? If you rinse first? Why?

• Give an example of a science sequence: First, you plant the seed in soil. Then you make sure it has water and sunlight. Next, you wait for the seed to grow into a plant.

• Tell students that scientists use a sequence of steps, called the scientific method, to learn about the natural world. Explain that in this topic, students will learn what happens in each step and will apply them to their own experiments.

• Look at the diagram. Which stages of the scientific method do you follow in your science lessons? Give examples. (30 min.)

• Have students follow the path of the diagram. Elicit details: What are the steps of the scientific method? Which is the first step? Which is the last?

Take the Lesson Further (10 min.)

• Ask about the main photo: Which step in the scientific method is this? (Observe.) What are they observing? (A rock.) Have students brainstorm observations about the rock. Elicit colors, textures and shapes.

Take the Lesson Further (10 min.)

• Elicit examples of other experiments or activities students have done in their science classes and, where possible, help students connect them to some of the steps in the scientific method.

• Use the diagram to elicit science vocabulary for the steps of the scientific method: observe is to look closely; a hypothesis is a guess about the results; an experiment is an activity to test the hypothesis; to record means to write down; to analyze is to make sense of information, or data; and a conclusion is a statement about what you learned.

• Write the diagram on the board, and go through the steps using the example of growing a plant:

  Think about plants you’ve observed. What do you think plants need to live? (Water.)

  Tell students they have just made a hypothesis. Ask: What experiment can you do to see if a plant needs water to live? (Stop watering it and see what happens.) What data can you collect and analyze? (How tall the plant is, whether it turns brown and dry, etc.) Let’s say you didn’t water the plant for a week. It stopped growing. It turned brown and dry. What conclusion can you make? (Plants need water to live.) Encourage students to phrase their conclusion in a similar way to their hypothesis.

  Finally, ask: Was your hypothesis correct? (Yes.)
1 Watch the video. What is the podcast about?

Watch again. Are the children happy with their project?

2 Listen and complete the poem.

Read the poem out loud.

3 Complete the sentences with science verbs.

Solids, Liquids, Gases

- Solids, liquids, gases don’t change or size.
- You can pour liquids from one container to another.
- When solids melt, they become liquids.
- When liquids pour, they become solids.
- Hold them in your hands, use your eyes.
- Change shape, but don’t change size.
- Fill your cup—you can see them with your eyes.
- Gases change and change size.
- They’re in the air.
- They’re hard to see, but they’re there.
**Vocabulary**

**Objectives**
Students will meet the Follow the Compass team and see their science fair project.
Students will learn and practice science verbs and nouns.

**Teaching Resources**
Video Episode 1, Video Worksheet 1, Flashcards Topic 1, Track 2, pictures of ice cubes and a glass of water

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**Lead in to the Lesson** (10 min.)

- Have students watch the video to review vocabulary related to shape and size.

**1 Watch the video. What is the podcast about?** (5 min.)

- Play the video and have students listen to it.

**Answer** How magnets make toner fluid change shape.

**Watch again. Are the children happy with their project?** (5 min.)

- Play the video again and have students watch for the characters’ reactions.

**Answer** Yes.

**Take the Lesson Further** (25 min.)
1. Play the video for students to number the scenes in order.
2. Read the true/false statements, and have students write their answers as they watch the video again. Encourage them to correct the false answers.
3. Have pairs match the questions and answers. Then play the video again for students to check.
4. Discuss the results of the experiment as a class.

**Answers**
1 b 2 c 3 d 4 a

**Present the Vocabulary** (15 min.)

- Read the vocabulary words aloud for students to repeat.

**Write the words size and shape on the board.**

- Have students add words to the mind maps.

- Use the flashcards to teach solid, liquid, and gas.

- Point to each picture on the page and ask students to identify what the boy is looking at (solid, liquid, gas). Point to the picture of the liquid and say: You can pour a liquid.

- Say: When something changes, it becomes different. When you blow air into a balloon, it changes size. It gets bigger.

- Say: Freezing and melting are two kinds of changes. When a liquid changes to a solid, it freezes. When a solid changes to a liquid, it melts.

**2 Listen and complete the poem.** (15 min.)

- Play Track 2 for students to listen and write. Then use the wording from the poem to review the definitions of solid, liquid, and gas: What doesn’t change shape or size? (A solid.)

**Know Your Students**
- Most students will find it helpful to hear the track twice to write and check their answers.
- Some students may need more support. You may wish to list the words on the board before students begin.

- To help students use changes in shape and size to distinguish solids, liquids and gases, ask: What happens if you put a (solid) in a jar? What happens if you don’t put it in a container?

**Answers** Solids, shape, Liquids, size, shape

**Read the poem out loud.** (15 min.)

**Manage Your Class**

- Read a few words at a time and have the class chorally repeat after you. Progress to reading a line or two at a time for students to repeat.
- Alternatively, have students work in pairs, taking turns reading line by line. They should progress to larger sections until each student can read the full poem aloud with correct pronunciation.

**Complete the sentences with science verbs.** (10 min.)

- Use the flashcards to reinforce the meanings of freeze and melt before students begin the activity. Then have students complete the sentences individually.

**Answers** 1 pour 2 melt 3 freeze

**Take the Lesson Further** (10 min.)

- Hold up pictures of ice cubes and a glass of water. Elicit that both are water: ice is a solid, and the water in the glass is a liquid. Say: How can you change water into ice? (Put it in the freezer.) In a cold place, it freezes. How does ice turn into water? (You leave it in a warm place.) In a warm place, it melts.

**Get Students Thinking**

- Have students work in small groups to brainstorm everyday examples of solids, liquids and gases at school or home (solids: desks, pencils; liquids: milk, juice; gases: air in a balloon, steam from a pot).
- Have groups tell the class one item they placed in each category. Ask questions to check their answers using the definitions of solid, liquid, and gas from the poem: Do pencils change shape or size? (No.) Does milk change shape? (Yes.) Does milk change size? (No.) Does air in a balloon change shape and size? (Yes.)
Grammar

**Objectives**
Students will use the present simple to express facts.
Students will discover and practice sequence adverbs.

**Teaching Resources**
Grammar Worksheet 1.1, Track 3

**Lead in to the Lesson (10 min.)**

**Present the Vocabulary**
- List the steps of the scientific method on the board, leaving out the words conclusion, data, experiment and hypothesis for students to complete. Review the meaning of each step.
- Recite the steps with students a few times. Then erase the steps and challenge students to say them in order.

**1 Listen and follow.**(15 min.)

- Have students preview the pictures in the comic. Ask: Where is Martina? (In the kitchen.) She is doing a science experiment. What is it about? (Ice.)
- Have students read the captions and relate them to the steps of the scientific method.
- Play Track 3 while students listen and follow silently.
- Ask comprehension questions based on the steps of the scientific method: 
  - What question does Martina ask? (Does ice melt faster in hot places?)
  - What is her hypothesis? (Ice melts faster in hot places.)
  - What is her experiment? (She puts a glass of ice in three places.)
  - What data does she analyze? (Time and temperature.)
  - What is her conclusion? (Ice melts fastest in the hottest place.)
  - Was her hypothesis correct? (Yes.)

**Present the Grammar** (20 min.)

- Remind students that they have already learned to use present simple verbs for routines and activities. Explain that present simple verbs are also used for statements that are always true, like scientific facts.
- Read aloud the first part of the entry. Ask about each part of the table:
  - What do you add to the end of the verb with “he,” “she” and “it”? (The ending “-s” or “-es.”)
  - What do you add to make the verb negative? (“Don’t” or “doesn’t.”)
  - How do you form a question? (Put “Do/Does” before the subject and verb.)

→ Read the comic. Circle present simple verbs. (10 min.)

- Remind students that present simple verbs for he, she and it end in -s or -es.

**Know Your Students**
- All students should be able to find affirmative verbs.
- Most students will also notice the verb in the question.
- Some students will also notice the present simple forms of be, including contractions.

**2 Complete the sentences with the present simple of these verbs.** (10 min.)

- Complete the first sentence as a class. Have students complete the rest of the sentences in pairs, or independently if they are able.

**Answers**
1 freezes 2 ask 3 don’t melt 4 Do, do 5 Does, melt

**Present the Grammar** (10 min.)

- Read the Sequence Adverbs section of the entry with the class. Have students find the sequence adverbs in the comic.
- Emphasize that students should begin with first and end with finally. The sequence adverbs in the middle do not have a set order.
- Point out that the sequence adverbs are placed at the beginning of the sentence and are usually followed by a comma.

**3 Describe Martina’s experiment using sequence adverbs. What does she learn about ice?** (10 min.)

- Students should focus on describing what happens in each picture using sequence adverbs.

**Know Your Students**
- Most students will be able to use sequence adverbs to put three statements in order, one per picture.
- Some students will be able to use sequence adverbs to put more than four statements in order, adding details about what Martina does: Then, she puts a glass of ice in front of a fan.

**Take the Lesson Further** (25 min.)

1 Have students do the first activity in pairs. Remind them to look for affirmative, negative and interrogative forms.
2 Review how to form affirmative and negative present simple verbs before students do the activity alone or in pairs.
3 Review how to form questions and short answers before students do the activity alone or in pairs.
4 Review sequence adverbs, and do the first item as a class. Have students complete the rest independently.

**Answers**
1 change, don’t change 2 doesn’t melt 3 melt 4 Does, boil

**Take the Lesson Further** (10 min.)

**Get Students Thinking**

- Play a Chain Game (see page xvi) with the class about steps in a process, such as making a peanut butter and jelly sandwich:
  - First, you get your ingredients.
  - Next, you put bread on a plate.
  - Then, you put the peanut butter and jelly on the bread.
  - After that, you put the sandwich together.
  - Finally, you eat it.
1 Listen and follow.

Listen and follow.

Read the comic. Circle present simple verbs.

2 Complete the sentences with the present simple of these verbs.

- ask
- do
- freeze
- melt
- not melt

1  In cold temperatures, water ______________ into ice.

2  Good scientists ______________ lots of questions.

3  Ice cubes ______________ fast in cold places.

4  ______________ you ______________ experiments in science class?

5  ______________ ice ______________ fast in warm places?

3 Describe Martina’s experiment using sequence adverbs. What does she learn about ice?
In a secret laboratory near you, teams of food scientists work on new food products every day. “Food scientists?” I hear you ask. “What do they do?” Well, I have some top secret pictures of the Incredible Food Lab.

Here is a typical day. Work starts at 8:00. The good food scientists are called Marvelabs. They arrive on time. Their job is to make fantastic new jello and ice cream. Mmmm!

First, the Marvelabs do research. They study fruit jello and vegetable jello! They find out how to make healthy ice cream and they research new flavors. Then, they do tests. “Is the food safe?” they ask. Next, they look at the color, shape and size of the food. After that, they taste the food. “Is it delicious or disgusting?” they ask. Finally, they send all their good ideas to the Incredible Food Factory. The factory makes the jello and ice cream and sends it to stores all over the world.

Matching Information in the Activity and Reading Text

When you do a reading activity, read the instruction and activity carefully. Underline important words in the instruction. Then look for similar words or ideas in the text.
BUT—and this is a very big but—not all the scientists in the lab are good. The bad scientists are called Madlabs. Madlabs often arrive late. They don’t have breakfast at home, so they eat breakfast in the lab. It’s not very sensible because sometimes their breakfast falls in the jello. The Madlabs ask silly questions like, “Is jello good for your hair?” “Can you swim in ice cream?” They don’t often do research, but they sometimes do dangerous tests, just for fun. The Madlabs often mix their bad ideas with the Marvelabs’ good ideas. Oh no!

So, the next time you have jello or ice cream, look carefully at the label. Do you see this logo? Watch out! This food comes from the Incredible Food Factory. It may be delicious… or it may be disgusting!

Please arrive on time! Don’t bring food into the lab! Don’t swim in the jello! Don’t carry heavy boxes!
1 Read “The Incredible Food Lab” again. Find these questions. Who asks them?
1 What do they do?
2 Is the food safe?
3 Is it delicious or disgusting?
4 Is jello good for your hair?
5 Can you swim in ice cream?

Read the secret recipe. Circle the ingredients on pages 10 and 11.

2 Find the adjectives in the text and match them with the definitions.

<table>
<thead>
<tr>
<th>dangerous</th>
<th>delicious</th>
<th>disgusting</th>
<th>safe</th>
<th>secret</th>
<th>sensible</th>
</tr>
</thead>
</table>
1 Something that can harm you is __________________________.
2 Something that tastes really bad is __________________________.
3 Something that very few people know is __________________________.
4 Somebody that has good judgment is __________________________.
5 Something that doesn’t harm you is __________________________.
6 Something that tastes great is __________________________.

Which adjectives are opposites?

3 Choose a character from the picture. Name your character and write three sentences about his/her day.

Name: __________________________________________________________
_______________________________________________________________
_______________________________________________________________

Share your sentences. Guess if other characters are Marvelabs or Madlabs.
Read “The Incredible Food Lab” again. Find these questions. Who asks them? (10 min.)

• Remind students to underline important words in the questions and scan the text for those words.

Answers 1 narrator 2 Marvelabs 3 Marvelabs 4 Madlabs 5 Madlabs

Read the secret recipe. Circle the ingredients on pages 10 and 11. (10 min.)

Manage Your Class
• Have students work in small groups, explaining their answers in complete sentences when possible: It’s a container for a liquid and it has a picture of a cow. I think it’s milk.
• Alternatively, students can work independently and then quiz a classmate about the locations.

Find the adjectives in the text and match them with the definitions. (10 min.)

• Have students find each adjective in the text and read the context before choosing the definition. Do the first adjective as a class as an example.

Answers 1 dangerous 2 disgusting 3 secret 4 sensible 5 safe 6 delicious

Which adjectives are opposites? (5 min.)

• Explain the meaning of opposite if necessary and then have students do the activity.

Answers safe, dangerous; delicious, disgusting

Take the Lesson Further (15 min.)

Integrate Learning Styles
• Encourage students to contrast the Marvelabs and Madlabs according to their learning style.
• Visual: Students draw and complete a Venn diagram for the Marvelabs and Madlabs.
• Auditory: Students listen to the story again and raise their left hand when they hear a detail about Marvelabs or their right hand for Madlabs.
• Read/Write: Students write a few sentences to compare and contrast the Marvelabs and Madlabs.
• Kinesthetic: Students mime the actions of either a Marvelab or a Madlab for the class to guess which.

Choose a character from the picture. Name your character and write three sentences about his/her day. (10 min.)

Know Your Students
• Most students will be able to use simple sentences to describe their character’s actions.
• Some students will be able to include descriptive adjectives and adverbs for their character.

Share your sentences. Guess if other characters are Marvelabs or Madlabs. (5 min.)

• Have students take turns reading their sentences for others to guess the character.
Present the Vocabulary (15 min.)

- Use the flashcards to introduce the new vocabulary. Have students think about this question: *How does liquid water turn into a gas?* Tell students that if liquid water gets very hot (100˚C), it *boils*, or turns into a gas quickly. Explain that water can also *evaporate*, or turn into a gas slowly, when the temperature is less than 100˚C. Tell students that water in the form of a gas is called *steam*, or water vapor. Explain that if it touches something cold, it *condenses*, or becomes a liquid.
- Have students use this vocabulary to explain what is happening in picture 1a (steam is condensing on a mirror), picture 2a (water is boiling in a pot and turning into steam) and picture 2b (water is evaporating and now there isn’t much in the pot).

Choose the correct verbs. (15 min.)

- Do the first item with the class as an example. Have students look first at the process in parentheses: *When water changes from a gas to a liquid, does it condense or freeze? (It condenses.)* Then read the sentence with the verb in place to check that it makes sense: *Steam condenses on cold surfaces.* Have students find the corresponding picture (1a) to help them visualize their answer.

Know Your Students

- Some students may be able to complete the activity in pairs or independently.
- Alternatively, do the activity as a whole class, modeling a think-aloud for one item and then calling on volunteers to do the same for the others.

Answers

1 condenses 2 evaporates 3 melts 4 freezes

Take the Lesson Further (20 min.)

Get Students Thinking

- Have students work in pairs or small groups to create a three-column chart. In the first column, they should write the verbs boil, condense, freeze, evaporate, melt. In the second column, they should write a simple definition of each. For condense, they might write changes from a gas to a liquid. In the third column, they should write an example, such as steam on a shower door.

What other things can melt, condense, freeze or evaporate? Discuss. (10 min.)

- Lead a brainstorming session: *What else melts? (Cheese, ice cream.) What else condenses? (Rain clouds, breath.) What else can freeze? (Food, juice.) What else can evaporate? (Ocean water, soup.)* Students can begin with ideas from their charts in the previous activity.
1 Where are the people in each dialogue? Look at the pictures and guess.

Listen and check.

1

2 Listen again. Choose the picture that shows the end of each story.

3 Choose the correct verbs.

1 Steam condenses / freezes on cold surfaces. (gas → liquid)
2 Hot water boils and evaporates / melts. (liquid → gas)
3 Snow condenses / melts in warm weather. (solid → liquid)
4 Rain condenses / freezes and becomes snow. (liquid → solid)

4 What other things can melt, condense, freeze or evaporate? Discuss.

Science Nouns
steam

Science Verbs
boil
condense
evaporate
Speaking

Agreeing and Disagreeing
I agree. I agree with (you/them/Kelly).
I don’t agree. I disagree.
Yes, I think that’s right.
No, I don’t think that’s right.

At what temperature do these things freeze?

<table>
<thead>
<tr>
<th>Freezing Temperature in Degrees Celsius (°C)</th>
<th>Water</th>
<th>Ketchup</th>
<th>Milk</th>
<th>Olive Oil</th>
<th>Eggs</th>
<th>Honey</th>
</tr>
</thead>
</table>

1 Listen and mark (√ or X).
1 The students make a hypothesis. 
2 Rashid agrees with Marisa. 
3 Johnny agrees with Marisa. 
4 Johnny agrees with Rashid.

Listen and write the temperatures for water and ketchup.

2 Discuss the question in activity 1 for milk, olive oil, eggs and honey.
Agree and disagree. Complete the chart.

| –1°C | –0°C | –6°C | never freezes |

I think milk freezes at –1°C.
I disagree. I think...

Listen and check.

3 Discuss.
1 Which things freeze at a lower temperature than water?
2 Which substance never freezes? Why?
**Know Your Students**

- Most students will be able to listen for the ketchup temperature and mark it in the chart.
- Some students may need help listening for the water temperature, as it is expressed only in relation to the ketchup temperature.

**Answers**

- Water: 0°C; Ketchup: –3°C

**Take the Lesson Further** (10 min.)

**Get Students Thinking**

- Encourage students to consider why the ketchup might have frozen at a lower temperature. Ask: *Are ketchup and water the same? (No.) How is ketchup different than water? (It's red; it's thicker.) Do you think there is some water in the ketchup? (Yes.)* Guide students toward the idea that water freezes at 0°C, but ketchup freezes at a different temperature because it also contains other ingredients that don't have the same freezing point as water.

2 Discuss the question in activity 1 for milk, olive oil, eggs and honey. Agree and disagree. Complete the chart. (15 min.)

- Have students work in small groups to hypothesize. Ask them to look at the options and choose a temperature for each item.
- Remind students to use phrases from the entry to express agreement and disagreement.
- Have students write their guesses.

**Listen and check.** (10 min.)

- Play Track 8 as students listen and write the correct answers below their own answers in the chart.
- If students are discouraged because their guesses were incorrect, remind them that the hypotheses of real scientists are not always correct, but they still learn something new from the results of their experiments.

**Answers**

- Milk: –1°C; Olive oil: –6°C; Eggs: 0°C; Honey: never freezes

3 Discuss. (15 min.)

- Have students discuss the questions in groups, supporting their answers with details from the experiment. Project or distribute copies of the transcriptions of Tracks 7 and 8 if needed. Remind students to use phrases from the entry to express agreement and disagreement.

**Answers**

- 1 Ketchup, milk, olive oil; 2 Honey; it has a lot of sugar and not much water.
Have students work individually to write a rough draft of instructions for the remaining steps.

Ask students to work in pairs to peer-edit for correct verb forms and sequence adverbs.

Encourage students to use a dictionary to check the spelling of their verbs.

Check students’ work, and then have them write a final draft on a clean sheet of paper.

Know Your Students

All students should be able to list the ingredients and materials labeled in the pictures.

Most students will be able to list the basic steps using imperative verbs and sequence adverbs.

Answers

First, mix cream and sugar in a bowl. Then, pour the mixture into a tray. Next, put the tray in the freezer for two hours. After that, take the tray out of the freezer. Finally, eat the ice cream.

Topic 1

How does science work?

1 What are the stages of the scientific method? (10 min.)

Write the steps of the scientific method on the board. Tell students that they’ve just written the instructions for the experiment step. Help them complete the other steps.

Point to observe and elicit the observation that we need to keep ice cream in the freezer so it stays frozen and doesn’t melt. Ask: What question will this experiment answer? (How long does ice cream take to freeze?) Elicit a hypothesis to answer the question: I think ice cream takes two hours to freeze in the freezer. Discuss what data students could collect and analyze (time, temperature, hardness). Say: After two hours, the ice cream is hard. What can you conclude? (Ice cream takes two hours to freeze in the freezer.) Was your hypothesis correct? (Yes.)

2 What new facts about science do you know now? (10 min.)

Have small groups of students look back through Topic 1 and make notes on what they know about solids, liquids and gases and how they change.

Ask groups to take turns giving the rest of the class sentences to complete based on their notes: When a solid becomes a liquid, it (melts). Invite volunteers to give real-life examples where possible.
1听并跟随。

**How can you make ice cream without a freezer?**

**Step 1**
First, pour the cream and sugar into the small bag and close it.

**Step 2**
Then, put the ice cubes and salt in the large bag.

**Step 3**
Next, put the small bag in the large bag and shake for five minutes.

**Step 4**
Finally, open the small bag. Does it look like ice cream? Eat it and see!

2看图片。描述每个步骤。

**How long does ice cream take to freeze?**

**Step 1**
1/2 cup of cream
2 large spoons of sugar

**Step 2**
6 spoons of rock salt

**Step 3**
5 minutes

**Step 4**

<table>
<thead>
<tr>
<th>1/2 cup of cream</th>
<th>2 large spoons of sugar</th>
<th>6 spoons of rock salt</th>
<th>5 minutes</th>
</tr>
</thead>
</table>

**Writing Instructions**

当你写指示时，不要包括你，只是使用简单的动词如放或倒。使用顺序副词来显示顺序。

- 写出实验的指示。
1 Listen and complete the song. ♪¹⁰

2 Write the correct lab equipment. Which are compound nouns?
   1 They protect your eyes: ________________________________.
   2 You put these on your hands: ____________________________.
   3 You use this to hold or pour liquids: ________________________.
   4 It cleans your eyes: _________________________________.
   5 You measure liquids in this: ________________________________.

 mạng Describe a piece of lab equipment. Can your partner guess what it is?
Vocabulary

Objectives
Students will acquire and practice words for lab equipment.
Students will understand how to form compound nouns.
Students will sing a song.

Teaching Resources
Two of each: blindfold, lab coat, pair of protective gloves, safety goggles or glasses, box with lid
Track 10, Flashcards Topic 1

Lead in to the Lesson (10 min.)
Before class, place a lab coat, pair of protective gloves and safety goggles or glasses in a box with a lid. Divide the class into two teams and ask for a volunteer from each team. Have each volunteer stand near a box and put on a blindfold. When you say “Go!” the volunteers open their box and race to correctly put on the items inside, while their team calls instructions to them: Put it on your right hand!

Present the Vocabulary (10 min.)
• Use the items from the boxes to teach students gloves, lab coat and safety goggles. For each item, say: It protects your... (hands, body/clothes, eyes).
• Point out the two parts of the word eyewash, and elicit that it is a way to wash your eyes if you get something harmful in them.
• Have students look at the other equipment on the page. Point out the microscope, and describe the containers for students to point to: A beaker has a wide mouth to pour liquids. A test tube is small and skinny. A cylinder is tall and straight. It has marks on it for measuring liquids.

1 Listen and complete the song. (20 min.)
• Play Track 10 while students listen and follow.
• Play the track again and tell students to fill in just the first few letters of each word as they hear it. They can go back and complete the rest of the word at the end.
• Play the track again for students to circle any unfamiliar words in the song.

Manage Your Class
• You can make a class list of unfamiliar words on the board and ask volunteers to look up each word and share the definition with the class.
• Alternatively, give small groups a dictionary and allow them to make their own word list.

Answers cylinder, beaker, eyewash, safety goggles, gloves

Listen again and sing along. (20 min.)
• Play the track twice so students can learn the song. The first time, have students listen and mouth the words. The second time, encourage students to sing along as much as they can.
• Divide the class into two groups to sing alternating lines or pairs of lines. Encourage students to make up movements or gestures as they sing.

2 Write the correct lab equipment. Which are compound nouns? (20 min.)

Get Students Thinking
• Have students first work alone to fill in the correct lab equipment. Then, in pairs or as a whole class, have them read each word and decide if it can be divided into two separate words.
• Students may mistake microscope for a compound word, but remind them that micro is not a word on its own.

Answers 1 safety goggles (compound noun) 2 gloves 3 beaker 4 eyewash (compound noun) 5 cylinder

Describe a piece of lab equipment. Can your partner guess what it is? (10 min.)

Know Your Students
• Most students will be able to use gestures, words or short phrases to describe the objects in the list.
• Some students will be able to use complete sentences to describe the objects and their use.

Take the Lesson Further (5 min.)
• Show the whole class the flashcards for beaker, cylinder, gloves and safety goggles, and ask: Which two protect you? (Gloves, safety goggles.)

Take the Lesson Further (15 min.)
• Have students record themselves singing the song in small groups. Let them play the track to sing along with, if it makes them more comfortable. This is a fun way to use technology in the classroom and let them hear their own pronunciation and intonation.
Grammar

Objective
Students will discover and practice the zero conditional to describe facts.

Teaching Resources
Flashcards Topic 1, Two glasses of water, table tennis ball or other object that floats, rock or other object that sinks, spoonful of salt or sugar, Track 11, Grammar Worksheet 1.2

Lead into the Lesson (10 min.)

- Help students understand how to express facts using the present simple. Ask, for example: What does ice do in warm temperatures? (It melts.)
- Have students use present simple verbs to make true or false statements about science facts they’ve learned. Prompt them by displaying flashcards from the topic. Ask the class to vote on whether the statements are true or false.

Present the Vocabulary (10 min.)

- Use realia to teach the science verbs. Drop a rock into a glass of water. Say: The rock sinks in the water. Then drop in a table tennis ball. Say: The table tennis ball floats in the water.
- Stir a spoonful of sugar or salt into a glass of water until the sugar or salt dissolves. Say: When I mix the sugar into the water, it dissolves.

1 Take the quiz. Listen and check. (11 min.)

- Have students preview the quiz and identify the items in the pictures. Explain that students are going to make guesses about scientific observations. Then have them take the quiz.
- Play Track 11, pausing after each item to discuss whether students’ guesses were correct. Ask: Did the answer surprise you? Why or why not?

Answers 1 c 2 c 3 b

Present the Grammar (15 min.)

- Read the entry with the class. If students are familiar with cause and effect, explain that they can think of the if/when clause as the cause and the main clause as the effect.
- Write the example sentences on the board, and invite volunteers to identify the condition and result clauses. Point out the present simple verbs.
- Rewrite the sentences with the clauses in reverse order: Ice cubes melt if you put them in a hot place. When you add sugar to coffee, it dissolves. Have volunteers identify the clauses. Point out that the clauses can come in either order.
- You may wish to point out that when the if/when clause comes first, it is followed by a comma, but if the result clause comes first, no comma is needed.

Look at the quiz again. Circle all the present simple verbs. (10 min.)

- Have students find and circle the verbs. Then review the present simple forms, and ask whether each verb is in a condition (if/when) or result clause.

Answers happens, do, put, don't move, melt, dance, put, sink, melt, float, add, turns, doesn't become, changes

2 Look and write. (10 min.)

- Make sure students understand the picture “equations” and the ✓ or ✗ beside each verb (for affirmative or negative). Once they understand the task, have them complete it alone or in pairs.

Answers 1 sinks 2 doesn’t become 3 doesn’t change

Take the Lesson Further (30 min.)

1 Have students complete the activity individually. Remind them that in the zero conditional, only one clause has if/when.
2 Have students complete the activity individually. Walk around to check their punctuation and use of if/when. Allow students to combine the clauses in either order.
3 Ask students to write their guesses individually, and then discuss the results as a class.

Answers 1 e 2 c 3 b 4 a 5 d • Red: 1, 3, 5, a, c; Blue: 2, 4, b, d, e 2 1 If the temperature is 0°C, water freezes. 2 If a scientist drops soap in a bowl of water, the soap floats. 3 Salt dissolves when you add it to warm water. 4 Sugar doesn’t dissolve when you add it to cold water. 5 When people put butter on hot toast, the butter melts. 3 Sample answers: 1 it doesn’t dissolve. 2 you float. 3 you get jello. 4 the hot water gets colder.

3 Write two more questions for the Great Big Science Quiz. (15 min.)

- Have small groups create each question by first writing a zero conditional statement and then replacing one of the verbs with three options.
- Model a question for the class: If you build a snowman on a cold day, it doesn’t melt. Replace doesn’t melt with a blank and invite students to suggest answer choices: (a) doesn’t melt, (b) melts, (c) dissolves.

Know Your Students

- Some students may write simple sentences rather than zero conditional statements: In cold temperatures, water freezes. You may wish to have them write two separate sentences first, one for the condition and one for the result.

Take the Lesson Further (10 min.)

Get Students Thinking

- Have students share their new quiz questions for the class to vote on the correct answer. Discuss how students could experiment to test their guesses.
1 Take the quiz. Listen and check.

The GREAT BIG Science Quiz!

What happens if I do that?

1️⃣ Raisins _________ if you put them into a glass of soda.
   a don’t move
   b melt
   c dance

2️⃣ Marshmallows _________ if you put them into water.
   a sink
   b melt
   c float

3️⃣ If you add fresh pineapple to your jello mix,
   a the jello turns yellow.
   b the jello doesn’t become a solid.
   c the pineapple changes color.

PAL Look at the quiz again. Circle all the present simple verbs.

2 Look and write.

1️⃣ = sink ✓
   This candy ______________ when you put it in water.

2️⃣ = become x
   Honey ______________ a solid if you freeze it.

3️⃣ = change x
   If you cover a cut apple with lemon juice, it
   ______________ color.

3 Write two more questions for the Great Big Science Quiz.

Zero Conditional

The zero conditional describes facts. The if/when clause describes a condition, and the main clause describes the result. All the verbs are present simple:

If you put ice cubes in a hot place, they melt. Sugar dissolves when you add it to coffee.

Science Verbs

dissolve
float
mix
sink
Predicting the Content of a Reading Text

Before you read a text, look at the title, headings and pictures. They can help you predict what the text is about.

Scientists spend hours doing experiments or looking at things under microscopes, but sometimes they discover things when they don’t expect to. Let’s travel back to the 1800s to learn about one amazing discovery.

The Accident

It is the year 1856 and William Perkin, an eighteen-year-old student at the Royal College of Chemistry in London, is trying to create a medicine to fight malaria. The result is a disaster! A disgusting black compound appears in the test tube.

The Next Step

William washes out the test tube with alcohol and gets a big surprise. The disgusting black mixture is now beautiful purple crystals. William shares his news with his brother and a friend. They do more secret experiments together to produce more purple crystals.
The Perfect Solution
The three young chemists make a solution with the crystals. They use it to try to make some silk purple. What happens if they wash the silk? It stays purple. If they leave it outside, it doesn’t change color, either. They are amazed! They call their new color mauveine. It isn’t long before William opens his own factory to produce and sell mauveine, the first synthetic dye, in large quantities.

The Color Purple
Until Perkin’s discovery, only kings and queens or very rich people wore purple clothes. Now everyone could have purple clothes. People loved it! But it wasn’t just clothes that could be purple—the post office produced purple stamps for the first time. It was official—purple was now one of the most popular colors!

The Difficulty with Dye
At this time, it’s very difficult to make purple dye for clothes. It’s also very difficult to find a natural dye that doesn’t disappear when you wash the fabric. Factories make natural dyes from plants and animals. They need a special liquid from more than 12,000 sea snails to make one purple dress! But William has an idea.

Amazing Mauveine
Synthetic dyes are now very useful in a lot of different areas of science and medicine. Thanks to the discovery of mauveine, the synthetic dye industry exists and we have clothes and paints in a whole spectrum of colors.
1 Read the article again. Mark (√ or X).

1 William Perkin planned to make a black chemical compound. ☐
2 The alcohol changed the black mixture into crystals. ☐
3 William told two other people about his discovery. ☐
4 If you put the solution on silk, the purple color doesn’t disappear. ☐
5 Perkin’s discovery changed the world of fashion. ☐
6 People only ever used mauveine to dye clothes. ☐

2 Label the pictures with these words from the text.

compound crystals drugs solution

1 [Image]
2 [Image]
3 [Image]
4 [Image]

3 Complete the sentences with the words.

1 If you mix drink powder in water, it becomes a ____________________________.
2 If you mix two or more elements, you create a ____________________________.
3 Salt and sugar have very small white ____________________________.
4 If I get sick, the doctor sometimes gives me a ____________________________ to help me.

3 Discuss. What does the story of William Perkin teach you about science and experiments?
Reading

Objective
Students will learn to preview a text to predict what it is about.

Teaching Resources
Printouts of simple newspaper or online articles with headings

Lead in to the Lesson (10 min.)

Get Students Thinking
• Show students newspaper or online articles and have them point to the headings. Use the printouts to discuss how headings help readers understand an article. Elicit that headings tell what each section is about, organize details in a logical way and help readers find information quickly.

Present the Skill (5 min.)
• Read the entry with the class. Explain that the title, headings and pictures are good clues to what the text is about. Knowing the topic before they start reading will help students comprehend the gist of the text, even if they don’t understand every word.
• Have students point to the title, headings and pictures on pages 18–19.

p. 18
+a Look at the title, headings and pictures in the text. What do you think the text is about? (5 min.)
• Have the class read the title and headings and describe the pictures on pages 18–19 as best they can.
• Ask: What do you think this text will be about? Write students’ predictions on the board to revisit later in this lesson.
+a Read and check. (20 min.)
• Have students read through the text once. Then review students’ predictions on the board and discuss whether they were correct.

Know Your Students
• Most students will need to begin by repeating the text one sentence at a time, as you read it aloud. They can progress to reading full sections chorally.
• Some students will feel comfortable reading whole sections aloud individually. Invite volunteers to each read a heading and the section that follows it.

p. 20
1 Read the article again. Mark (√ or X). (15 min.)
• Read the statements with students and help them identify key words. Students can underline the key words and look for them in the text to help confirm if the statements are true or false.
• Have students complete the activity individually. Then invite volunteers to correct the false sentences.

Take the Lesson Further (10 min.)
• Have students practice using headings to find information in the text.

Manage Your Class
• Have students work in pairs, with one student reading a sentence from the text and his or her partner naming the correct heading.
• Alternatively, do this activity as a game for the whole class in two teams. Read a detail and have teams race to find the section for the team captain to call out. Teams get a point for each correct answer, but they lose a point for each incorrect one.

2 Label the pictures with these words from the text. (10 min.)
• Have students find each word in the text and read the context for clues to the word’s meaning. Then have them label the pictures. Check students’ work before they do the next activity.

Answers 1 solution 2 crystals 3 compound 4 drugs

+a Complete the sentences with the words. (10 min.)
• Have students work alone to complete the sentences.

Answers 1 solution 2 compound 3 crystals 4 drug

Take the Lesson Further (10 min.)
• Ask students if they have seen the word compound before (compound nouns). Have pairs look up compound and solution in a dictionary and find two meanings for each.

3 Discuss. What does the story of William Perkin teach you about science and experiments? (10 min.)

Get Students Thinking
• Guide students to think about how William Perkin’s observations led to surprising discoveries. Ask: Did William Perkin’s first experiment succeed? What happened that surprised him? What did he do next? Elicit that Perkin kept following the scientific method with the purple crystals, and this in turn led to more questions and new experiments and discoveries.

Integrate Science
• Help students work in small groups to investigate another famous accidental discovery in science (such as penicillin, Coca-Cola, the microwave or the Slinky spring toy). They can research using online or print sources. Then have groups report to the class what they learned about how the accidental discovery led to something important.
Listening

**Objective**
Students will learn to focus their listening by first identifying specific information to listen for.

**Teaching Resources**
Track 12 and transcript (one per student), twelve plastic cups, water, eight paper towels, food coloring (red, yellow, blue, green, black, white)

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**Lead in to the Lesson** (10 min.)
- Tell students to listen for the answer to this question: *What is the dog's name?* Say: *The Wilsons just got a new dog. She is brown and white. She is six months old. Her name is Lulu. They love her already.*
- Ask: *What is the dog's name? (Lulu.)* Then ask how old Lulu is (six months), and see how many can recall the answer. Point out that students could answer the name question more easily because they knew what to listen for ahead of time.

**Present the Skill** (10 min.)
- Read the entry with the class and relate it to the listening activity from the Lead in to the Lesson.
- Explain that students can identify the information they need to listen for by reading the activities or questions first, before they listen.

1. Listen. What equipment does Oscar use? Mark (✓ or X). (10 min.)
   - Read the instructions with the class and ask: *What kind of information are you listening for? (Equipment.)*
   - Read through the answer choices with students so they know what words to listen for.
   - Play Track 12 and have students check off the words they hear. They can go back at the end and mark an X on the remaining boxes.
   - **Answers** beakers ✓, paper towels ✓, safety goggles X, water ✓, food coloring ✓, orange juice ✓, test tubes X, microscope X

2. Listen again. Number the pictures in order. (15 min.)
   - Read the instructions with the class and ask: *What kind of information are you listening for this time? (Order of steps.)*
   - Before students listen, have them preview the pictures and describe what they see.
   - Play Track 12 again for students to number.

   **Answers** 4, 1, 6, 2, 3, 5

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**How does the experiment work? Complete the sentences. Then listen again and check.** (15 min.)
- Have students work in pairs to complete the sentences based on what they remember.
- Play Track 12 again for students to check their work. Remind students to listen for the sentences from the activity.
- Allow students to use a transcript of Track 12 to check their spelling.

**Answers** 1 absorbs 2 travels 3 mixes, changes

**Discuss. What happens if you do the experiment with these colors?** (15 min.)
- Divide the class into four groups, one for each color combination. Have them discuss and agree on a hypothesis for their assigned colors. Have students express their hypothesis using the zero conditional.

**Answers**
1. When you mix red water and yellow water, you get orange water.
2. When you mix green water and yellow water, you get light green water.
3. When you mix blue water and red water, you get purple water.
4. When you mix black water and white water, you get gray water.

**Take the Lesson Further** (30 min.)
- Have students stay in their groups from activity 2 and make a presentation about their assigned colors. Allow groups time to assign roles and practice.

**Integrate Learning Styles**
Encourage students to choose an activity that suits their learning style, or choose one for them.

- **Visual:** Students draw a picture of what happens when their two colors are mixed in the middle cup.
- **Auditory:** Students retell the experiment as related on the track, replacing the colors with their own.
- **Read/Write:** Students write their hypothesis, their experiment, their results and their conclusion.
- **Kinesthetic:** Students demonstrate the experiment using their assigned colors.

**Take the Lesson Further** (15 min.)
- Get Students Thinking
  - Have students each draw a color wheel with six sections. They should first color in red, yellow and blue, leaving a blank space between each. Then they can color in their predictions for mixing these colors (orange, green, purple). Have students use the color wheels to discuss what happens when you mix colors.
1 Listen. What equipment does Oscar use? Mark (√ or X).

- beakers
- paper towels
- safety goggles
- water
- food coloring
- orange juice
- test tubes
- microscope

Listen again. Number the pictures in order.

How does the experiment work? Complete the sentences. Then listen again and check.

1 When you put the paper into the beaker, it __________________________ the water.
2 The colored water __________________________ along the paper towel and into the middle beaker.
3 When the blue and yellow water __________________________, it __________________________ to green.

Discuss. What happens if you do the experiment with these colors?

1  +  = ?
2  +  = ?
3  +  = ?
4  +  = ?

Listening for Specific Information
Before you listen, read the activity and identify what type of information you need to listen for, such as a name, a number or a place. Then listen carefully for the information.
1 Listen and follow. How does Sam show that he’s interested? 
Gina: Do you want to help me with my experiment?  
Sam: Sure!  
Gina: Great! We need two oranges, one with the skin and one without, and a bowl of water.  
Sam: OK. What do I do?  
Gina: First, put the orange with the skin in the water. What happens?  
Sam: It floats. That’s interesting.  
Gina: Now, what happens if you put the orange without the skin in the water?  
Sam: It sinks. That’s amazing! Why does that happen?  
Discuss. Why does this happen? Listen and check. 

2 Choose an experiment. Read about it.  

Floating Letters  
Equipment  
• some M&Ms  
• a bowl of water  
Instructions  
1 Put the M&Ms into the water.  
2 Wait. Watch the letters on the M&Ms.  
Result  
The M&Ms sink. The color dissolves. The letters don’t dissolve. They float.  

Floating Lemons and Sinking Limes  
Equipment  
• two lemons  
• two limes  
• a bowl of water  
Instructions  
1 Put one lemon and one lime into the water.  
2 Take the skin off the other lemon and lime.  
3 Put them into the water.  
Result  
The lemons float with and without the skin. The limes sink with and without the skin.  

Showing Interest  
Really?  
That’s interesting.  
That’s amazing!  
Wow!  

3 Role-play your experiment.  
Do you want to help me with my experiment?  
Sure. We need two lemons, and two limes.  
Discuss. Why does this happen?
Speaking

Objective
Students will learn and use phrases to express interest in order to be polite and keep a conversation going.

Teaching Resources
Tracks 13–14, handful of M&Ms, two bowls of water, two lemons, two limes

Lead in to the Lesson (5 min.)
• Invite one or two volunteers to tell you about something interesting they did last weekend. Respond by showing interest: Really? That’s interesting. That’s amazing! Wow!
• Then ask the class: Was I bored or interested? When someone acts interested, do you want to tell them more?

Present the Skill (5 min.)
• Read the entry with the class, modeling each phrase for students to repeat with correct intonation. Explain that using these expressions to show interest is polite and keeps the conversation going.

1 Listen and follow. How does Sam show that he’s interested? (15 min.)
• Play Track 13 and have students listen and follow. Ask comprehension questions: How are Gina’s oranges different? (One has the skin on and one doesn’t.) What does she do with them? (She puts them in water.) What happens to the orange with the skin? (It floats.) What happens to the orange without the skin? (It sinks.)
• Play the track again and have students underline expressions that Sam uses to express interest.
Answers That’s interesting. That’s amazing!

Discuss. Why does this happen? Listen and check. (10 min.)
• Have pairs or small groups speculate about why the orange floats with its skin but sinks without its skin.
• Play Track 14 for students to check. Tell students that an orange peel has tiny air bubbles inside that help the orange float—similar to the way that students might float in a pool while holding an inner tube.

Take the Lesson Further (5 min.)
• Write the expressions from the entry on the board. Ask students to add other phrases they know that show interest: Cool! Fantastic! Awesome!

2 Choose an experiment. Read about it. (15 min.)
• Have students read their chosen experiment and make a drawing of each step and the final result.

Manage Your Class
• Have students read both experiments individually and choose one to draw. Group students for the next activity according to the experiment they chose.
• Alternatively, group students and assign each group one experiment to read and draw together. Use the same groups for the next activity.

3 Role-play your experiment. (20 min.)
• Students should use the dialogue in activity 1 as a model for their role play. To help them, list the equipment, instructions and result from activity 1 on the board (similar to the format in activity 2). Have students find the corresponding information in the dialogue.

Know Your Students
• Most students will be able to substitute equipment and steps from their chosen experiment into the dialogue from activity 1.
• Some students will be able to customize the dialogue using their own words.

• Have students prepare a role play in small groups. They can use their drawings for reference. Remind students to show interest.
• Ask groups to practice and then present their role play. Have the other students listen and raise their hand when they hear someone showing interest.

Take the Lesson Further (5 min.)
• Do both experiments as a class. Encourage students to respond to what they see by showing interest.
• Have students come up and look at the letters on the M&Ms before they are dropped in the water and afterward, so they can see the letters floating.

Discuss. Why does this happen? (15 min.)
• Discuss the experiments one at a time.
• Ask: Why do you think the M&Ms sink but the letters float? Elicit the idea that the letters are lighter, but the candies are heavier. Why do you think the color dissolves? Have students recall the food coloring experiment from Lesson 10. Guide them to the idea that the coloring on the M&Ms might be similar.
• Ask: How are the lemons and limes different from the oranges in the first experiment? (The skin doesn’t change whether they float or sink.) Why do you think the limes sink? (The limes are small but heavy.)

Take the Lesson Further (10 min.)

Get Students Thinking
• Have students make a two-column chart with the results of all three experiments. Title the columns “Float” (orange with skin, M&M letters, lemon with skin, lemon without skin) and “Sink” (orange without skin, M&M candies, lime with skin, lime without skin).
A

Share your results. Identify the steps in the scientific method. (30 min.)

• Have students share their data from the invisible-ink experiment (their secret messages).
• Review the experiment in terms of the scientific method. Ask: Was your hypothesis correct?

Manage Your Class
• If groups have done different experiments, have a "science fair" where groups display their results and describe how they followed the scientific method. Prompt students: What was your observation? What question did you ask? What was your hypothesis?

Take the Lesson Further (20 min.)

Get Students Thinking
• Have students brainstorm other experiments they could do based on their results from the invisible ink: How long does it take for lemon juice to change color? At what temperature does lemon juice change color? Do any other fruit juices change color if you heat them? If possible, do one of the experiments as a class.

Topic 1

How does science work?

1 Choose an experiment. Explain how the science works. (30 min.)
• Divide the class into small groups and assign each group an experiment from Topic 1 to present to the class as a review. Allow groups time to assign roles and practice.

Integrate Learning Styles
• Allow students to choose a role that suits their learning style, or choose one for them.
• Visual: Students can draw visual aids, such as pictures of steps in the experiment.
• Auditory: Students can do the talking during the presentation.
• Read/Write: Students can write a paragraph to explain the experiment.
• Kinesthetic: Students can choose a simple way to act out or demonstrate their experiment.

2 In your opinion, which experiment in Topic 1 is the most interesting? (10 min.)
• Have the whole class discuss which of the experiments is the most interesting and why. Elicit which experiments seemed like the most fun to do or to watch, and which results were most surprising.
Project

Experiment: Classroom Science

Do an experiment following the scientific method. Make a conclusion and share the results with the class.

Invisible Ink

- lemon or lime juice
- water
- spoon
- beaker
- cotton swab
- sheet of paper
- lamp

How does science work?

1 Choose an experiment.
   Explain how the science works.

2 In your opinion, which experiment in Topic 1 is the most interesting?

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1 Look and match.

1 Equipment  2 Instructions  3 How It Works

1 Mix some lemon juice and water in the beaker.
2 Dip the cotton swab in the mixture to make it wet.
3 Write a secret message for a friend on the paper using the swab.
4 Wait for the paper to dry.
5 Give your secret message to your friend. He/She heats the paper near a lamp and reads it.

The water and lemon juice mixture is difficult to see on the paper.
If you heat lemon juice, it changes color and becomes brown.

2 Do the invisible ink experiment or choose another. Follow the scientific method.
   Share your results. Identify the steps in the scientific method.