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## Part 2: Writing to Apply



## Part 3: Assessing Writing

# Think Sheet

## Background Information

The Think Sheet strategy enables students to examine their knowledge on a science topic with your support and guidance before reading about it, and then compare that to what they learn after reading or discussion. This strategy provides practice in generating information related to a topic, which students need to learn for the prewriting phase. Students also use the revising skill of analyzing existing notes for missing or incorrect information in order to develop and strengthen their writing. Both skills are keys to successful writing.

## Grade Levels/Standards Addressed

See page 63 for the standards this strategy addresses, or refer to the Digital Resource CD (standards.pdf) to read the correlating standards in their entirety.

## Genre

Expository

## Stages of Writing Process

Prewrite, Revise

## Preparation

Prior to a reading, lecture, experiment, or observation, formulate some questions about the topic that will activate prior knowledge, generate thinking, and promote curiosity. Then, add the questions to the *Think Sheet* activity sheet (page 73, thinksheet.pdf).

## Activity

Distribute the prepared *Think Sheet* activity sheet, display it using a document camera, or re-create it on the board. Present the main issue to the class, and ask students to answer the questions and write down what they know. Be sure to encourage them to write any questions that they have about the topic because questions are the foundation of scientific research. Collect students' activity sheets and then assign the reading or complete the activity as planned. Redistribute the activity sheets so that students can use their new knowledge to edit their original answers. Ask questions such as, "How did your knowledge change after this activity? Can you add any additional information? Do you have any questions that were not answered? Were any of your original thoughts inaccurate?" Encourage students to write additional questions they have on the topic. Allow students to share what they have learned from the reading and encourage them to make connections between their questions, their thoughts, and the information presented in the text in order to develop and strengthen their writing.

## Variation

Complete this activity as a class with primary grade students. Lead a brief discussion about each question, and ask students to help develop an answer. You may choose specific students to help write some or all of the sentences on the board.

## Differentiation

Spend time clarifying the questions that are being asked for English language learners. Remind students that these are new questions and they are not expected to know the answers. Encourage above-level students to conduct further research to answer the questions left unanswered and share their findings with the class. Scaffold the activity with some completed responses for below-level students. If the reading level is too high, read aloud to them or have them do a paired reading.

# Think Sheet *(cont.)*

## Grades 1–2 Example (before reading)

**Main Issue:** The Seasons

| Teacher Questions | My Questions/Thoughts |
|---|---|
| **1.** Can you name the four seasons?<br>*spring, winter, summer, fall*<br>**2.** What are clouds made of?<br>*Clouds are made of tiny droplets of water.*<br>**3.** What makes it rain?<br>*Water drops in the cloud get too heavy. Then, they fall to the ground.* | I know that there are four seasons. They are spring, summer, fall, and winter. I don't know why there are four. What makes one season go away and another one come? What makes rain turn to snow? |

## Grades 3–5 Example (after reading)

**Main Issue:** Plants and Carbon Dioxide

| Teacher Questions | My Questions/Thoughts |
|---|---|
| **1.** What makes a plant grow?<br>*All plants need sun, soil, and water to grow.*<br>**2.** What are the basic parts of a plant?<br>*The parts are flowers, seeds, the stem, leaves, and roots.*<br>**3.** How do plants make food?<br>*I know it has to do with the leaves. I need more information.*<br>*I learned that chlorophyll inside each leaf helps the plant use energy from sunlight to make food.* | How can you tell if a plant is poisonous? What makes some plants grow taller than others? What is carbon dioxide?<br>Carbon dioxide is a gas in the air. That is what we breathe out when we exhale.<br>I still need to find out how to tell if a plant is poisonous and what makes some plants grow taller than others. |

# Think Sheet *(cont.)*

## Grades 6–8 Example (after reading)

**Main Issue:** Energy

| Teacher Questions | My Questions/Thoughts |
|---|---|
| **1.** How does heat flow from warmer materials or regions to cooler ones?<br>*I know that heat energy flows because of convection and radiation.*<br>**2.** What are the laws of conservation of energy?<br>*I know that energy cannot be created or destroyed. It can only change from one form to another.*<br>**3.** What is energy?<br>*I know it is a product of many substances such as heat, chemicals, and nuclear fission.* | What are the differences between heat, chemical, and nuclear energy?<br><br>How can you change one form of energy to another?<br><br>How can we use different energy sources to help our energy shortage? |

## Grades 9–12 Example (after reading)

**Main Issue:** Reflection and Refraction

| Teacher Questions | My Questions/Thoughts |
|---|---|
| **1.** What is the refraction of light?<br>*Refraction occurs when the direction of the waves of light change.*<br>**2.** How do you measure reflection?<br>*Reflection is measured by looking at the incident (incoming) ray and the reflected ray in terms of the normal, or a line perpendicular to the plane surface.*<br>**3.** How does the density of the substance the light is traveling through affect refraction?<br>*If the light is passing from a less dense substance to a more dense substance, the ray will be bent toward the normal. If it is going from a more dense substance to a less dense substance, the ray will be bent away from the normal.* | What happens when you look into a mirror? Why is the reflected image reversed?<br><br>How do eyeglasses work in terms of refraction?<br><br>How does light reflect off of irregular surfaces? |

**Name:** _____ **Date:** _____

# Think Sheet

**Directions:** Write your answers to the questions from your teacher. After the science reading assignment or activity, write any thoughts or questions that you have about the topic.

**Main Issue:** _____

| Teacher Questions | My Questions/Thoughts |
| --- | --- |
| | |