2ND-3RD GRADE LESSON

SmokeyToons: A Look at Fire and Human Behavior

NUTSHELL

In this lesson, students examine ashes from paper to describe the changes that fire can cause. They also learn the elements necessary for fire to exist by studying a burning candle. Students then distinguish the difference between good and bad fire situations and learn what they can do to prevent bad fire situations. In conclusion, students create a cartoon that conveys a fire prevention message.

BIG IDEAS

- In Wisconsin, there are two main types of wildland fire – wildfire and prescribed fire. Wildfires start without the intent of the landowner or land manager and are uncontrolled and unwanted. Prescribed fires are contained and are planned to meet the goals of a landowner or land manager. (Subconcept 1)
- The ignition of wildland fire can be caused by human activity (e.g., debris burning and other outdoor burning, machine sparks, children playing with matches, power lines, fireworks) or natural sources (e.g., lightning, spontaneous combustion). Human activity is responsible for most wildland fires in Wisconsin. (Subconcept 2)
- Fire requires oxygen, heat, and fuel to exist. Collectively these elements are known as the fire triangle. Under most conditions, the three elements can be manipulated to slow or stop the spread of fire. (Subconcept 3)
- Individuals have the responsibility to start and stop fires in safe and effective ways. Citizens who illegally start a fire or carelessly allow a fire to escape may be penalized with fines and even imprisonment. (Subconcept 26)

OBJECTIVES

Upon completion of this lesson, students will be able to:

- Describe the physical changes fire can cause.
- List the three elements fire needs to exist.
- Distinguish the difference between a good fire and a bad fire.
- Identify activities that can cause destructive wildfire.
- Identify actions they can take to reduce the risk of destructive wildfire.

SUBJECT AREAS

English Language Arts, Health, Science, Visual Arts

LESSON/ACTIVITY TIME

- Total Lesson Time: 105 minutes
- Time Breakdown:

Introduction	10 minutes
Activity 1	15 minutes
Activity 2	10 minutes
Activity 3	20 minutes
Conclusion	50 minutes

TEACHING SITE

Classroom

BACKGROUND INFORMATION

A fire can have positive effects or potentially dangerous effects. Positive fires are those that are safe and do not cause the loss of life, property, or natural resources. Potentially dangerous fires exist when humans don't take every precaution to monitor and prevent fires from becoming dangerous. For a fire to start and continue to burn, three elements must be present – heat, fuel, and oxygen.

(Continued on page 24.)

MATERIALS LIST

FOR EACH STUDENT
- Copy of Student Page **1**, *The Fire Triangle*
- Copy of Student Page **2**, *Make It Safe!*
- Copy of Student Page **3**, *How Do I Draw a Cartoon?*
- Pencil and paper
- Red colored pencil or marker

FOR EVERY 2 TO 3 STUDENTS
- Bowl of paper ashes

FOR THE CLASS
- Overhead projector (optional)

FOR THE TEACHER
- Candle
- Lighter
- Jar that fits tightly over the candle
- Cartoon from a newspaper
- Overhead transparency of Teacher Page **1**, *Make It Safe! Answer Key* (optional)

TEACHER PREPARATION

- Burn five to 10 pages of white paper in a clean, fireproof receptacle such as a grill, barrel, or metal bowl. Be sure to use paper free of paint, glue, and other forms of decoration, coloring, or plastic. Let the ashes sit for at least two hours and transfer them to a sealed container. Bring the container to class with enough bowls or similar receptacles to provide an ash sample to each group of two to three students.
- Find a stout, stable candle and a clear glass jar that fits over it. Be sure that the candle and jar fit together snugly. Test the candle's stability, light it, and place the jar over the candle to make sure that the seal is tight enough to cause the candle to extinguish in a short period of time.
- Make an overhead transparency of Teacher Page **1**, *Make It Safe! Answer Key* (optional).

SAFETY PRECAUTIONS

- When examining the ashes in the introductory activity, students should not place the ashes in their mouths or rub their eyes with their hands. Be sure that students understand that all of the ashes must stay in the bowl. You may wish to allow students to wash their hands after the exercise.
- When using the candle in Activity 1, be sure that the candle is visible but out of reach of all students. It should be in a stable location away from flammable materials. Be sure that students to not touch or play with the candle.

There must be heat to start and continue a fire, fuel to burn, and oxygen to facilitate combustion. These three elements are referred to as the fire triangle. The removal of any one of these three elements will extinguish a fire. When working with any fire, an adult needs to keep watch on the fire, have a shovel and water available, and know how they can extinguish the fire. A shovel can be used to remove fuel from the area, remove oxygen by smothering the fire with dirt, and smothering flames by patting them with the blade. Water on a fire not only removes heat, but also blocks the flow of oxygen to the fuel and decreases the flammability of surrounding fuels.

For more information on wildland fire, see the Wildland Fire Background starting on page 152.

PROCEDURE

INTRODUCTION – FIRE CAN CAUSE BIG CHANGES

1. Seat students in groups of two or three. Tell the class that they are going to learn about a very powerful and dangerous, yet very important part of nature – fire. Tell students that you are about to pass around an object inside a bowl, and they will need to work with the other students in their group to answer three questions about it. Write the following questions on the board:

   - What is it?
   - What was it before?
   - What happened to it?

2. Give each group a bowl that contains ashes from paper. Tell students that they can touch the contents, but all the contents must stay in the bowl. As students look at the ashes, encourage them to discuss and answer the questions.

VOCABULARY

Burn Barrel: A metal receptacle, most often a barrel, used for burning waste outdoors. Waste includes materials legal to burn such as wood and paper and materials illegal to burn such as plastic and metal.

Fire Triangle: The three elements (i.e., fuel, oxygen, heat) necessary for combustion to occur.

Fuel: Any material that can burn.

Wildfire: A wildland fire that ignites and spreads without the intent of the landowner.

3. Once all groups have finished, have some students share their answers to the questions. Add the following discussion questions to help students build on their answers:

   - What is it? *(Ash.)*
   - What was it before? *(Paper.)*
   - What happened to it? *(It burned.)*
   - What is the difference between the paper at the beginning and the ashes at the end? *(Paper is whole, white, strong, and doesn't smell. The ashes are small, black, fragile, and have an odor.)*
   - Are the differences easy to see? *(Yes. The ashes are very different from paper.)*
   - Do the ashes serve the same purpose as the paper? *(No. You cannot write or draw pictures on the ashes. Fire has not only changed the way the paper looks and smells, but also what it can be used for.)*
   - What other things do you think fire can change? *(Fire can cause big changes in objects such as chairs and desks, buildings such as houses and schools, living things such as trees and animals, and even large areas such as cities and forests.)*

4. Collect the bowls from the groups and have students return to a class seating arrangement.

   Tell the class that fires are both powerful and dangerous because they have the ability to cause very big changes in many of the things that we need to live. Fires can burn cities and forests, leaving both people and wildlife without homes.

   Tell the students that they are going to learn about what fire needs in order to burn and what type of situations lead to bad fires.

ACTIVITY 1 – WHAT DOES FIRE NEED?

1. Show the students a candle. Tell them that there are three things that need to be present in order to have fire. Tell them that the three things can be represented by a triangle. Draw a large triangle on the board.

2. Ask the students what the candle is made of. *(Wax.)* Ask the students if the wax will burn. *(Yes.)* Ask the students if the candle would still burn if it were made of stone. *(No.)* Tell students that fire needs fuel to burn and the wax is the fuel. Write "fuel" on one side of the triangle you have drawn on the board.

3. Direct students' attention back to the candle. Ask the students why, if the candle is made of wax, it is not burning. *(It has not been lit.)* Ask the students what the candle needs in order to burn. *(Heat.)* Explain that heat is another side of the triangle. Write "heat" on another side of the triangle on the board. Then light the candle. Point out that the flame they see is a very small fire.

4. Tell the students that you are about to place a glass jar over the candle. Ask the class to guess what will happen. Have different students offer scenarios and have each give a good reason. For example, if a student says that the oxygen will run out, ask the student to explain why and guess how long it will take.

   Place the jar over the candle making sure that it fits tightly against the surface it is sitting on. When the flame extinguishes, have students explain what happened. *(The flame needs oxygen. It used all of the oxygen in the jar. When the oxygen ran out, the flame went out.)* Write "oxygen" on the third side of the triangle on the board.

5. Relight the candle. Ask the students to focus on the candle and ask them the following questions:

   - Where does the oxygen come from? *(The air in the room. The atmosphere. Oxygen is present in the air that we breathe.)*
   - What is the fuel that the fire is burning? *(The fire is burning the wick and candle wax.)*
   - How did the candle light (i.e., what provided the candle the heat it needed to light)? *(The heat came from the lighter – a spark and a flame.)*

   Hold the lit candle up so that it appears to be inside the triangle. Tell the students that the flame on the candle would not exist if the air around it did not contain oxygen, if it did not have fuel (the wick and wax) to burn, and if it did not have heat (the lighter) to light the candle. Remind the students that the flame cannot exist without all parts of the fire triangle (i.e., oxygen, heat, and fuel).

6. Hand each student a copy of Student Page **1**, *The Fire Triangle*. Ask the students to fill in the blank in the sentence, "The oxygen that fire needs is found in the _ _ _ all around us." *(Air.)*

   Have the students list different materials that can act as fuels. *(Wood, paper, trees, leaves, houses, etc.)*

   Have the students fill in the blank in the statement, "Most fires in Wisconsin are started by _ _ _ _ _ _." *(People.)*

ACTIVITY 2 – GOOD FIRE, BAD FIRE

1. Have students raise their hands if they have been at a campfire or sat by a fire in a fireplace.

   Tell students that fire has many uses; have students think of a few. *(Heat [e.g., a fireplace], light [e.g., a candle], cooking [e.g., a gas stove or campfire], and recreation [e.g., a campfire]).* Tell the class that each of these uses serves a purpose for a person or group of people – to keep warm, to eat, to relax, etc.

2. Tell the class that they have learned that fire can be useful and they also know that it is powerful and can be very dangerous. Place the titles "good fire" and "bad fire" on the board. Ask the class to help you distinguish between a fire that is useful and one that is dangerous. Start with good fire and have students brainstorm a list of words to describe a good fire. *(Safe, responsible, small, campfire, controlled, not dangerous, and useful.)* Next, brainstorm a list of words that describe bad fire. *(Dangerous, destructive, hot, out of control, hurt, death, and afraid.)*

   Have students use the words to write complete sentences that answer the question, "What is the difference between a good fire and a bad fire?" Have students share what they have written. Write the sentences on the board. The sentences should be similar to those listed below.

   - A good fire is safe and useful.
   - A good fire is started and used by a responsible adult.
   - A bad fire is started irresponsibly.
   - A bad fire is dangerous (it can destroy living and nonliving things).

3. Tell the class that they know that fire is powerful and dangerous (i.e., has the potential to cause great changes). They know that it is useful in different ways (e.g., to light a dark room). They know what fire needs to exist (i.e., oxygen, heat, and fuel). And, they have just learned the difference between useful and dangerous fires.

   Tell the class that they are now ready to learn how bad fires start and how they can be prevented.

ACTIVITY 3 – HOW CAN WE PREVENT DESTRUCTIVE FIRES?

1. Remind the class that most destructive wildfires (bad fires) are started accidentally by people. Tell the class that they have the ability to stop activities that can cause bad fires.

   Give each student a copy of Student Page **2**, *Make It Safe!* Lead the class in identifying the dangerous situations in each picture. Some of the pictures contain more than one dangerous situation. As students identify what makes the situation dangerous, have them circle the portion of the picture with a red colored pencil or marker.

   Dangerous Situations Key:

   - *Picture 1:* There are no people present around the campfire. There is wood outside the fire ring. There is no shovel or bucket of water to extinguish the fire.
   - *Picture 2:* The boy is playing with matches.
   - *Picture 3:* There is no one near the burn barrel and a fire is burning. Debris is too close to the burn barrel. There is no water source present. There is no screen over the barrel.
   - *Picture 4:* Children are playing with fireworks without an adult present. There is no water source present.

2. Once students circle the dangerous situations in each picture, ask them what could be done to make each of the pictures safe. Remind students that good fires are useful and controlled and they are started and used by a responsible adult. Ask the class to identify a few responsible adults that they know. *(Parents, guardians, teachers, older siblings, etc.)* Help students identify safe activities similar to those pictured on Teacher Page **1**, *Make It Safe! Answer Key*. You may wish to show students the key on an overhead projector.

3. After you have finished discussing dangerous and safe fire situations, have students write statements about safe fire use at the bottom of the Student Page **2**, *Make It Safe!* Students will use these ideas for the cartoon they create in the concluding activity, so having several ideas will be helpful. Suggestions include: share what you know with other people, always be careful around fire, find an adult if you see an unsafe fire, use fire responsibly, don't play with matches, don't play with fireworks unsupervised, don't leave fire unattended.

CONCLUSION – SMOKEYTOONS

1. Tell students that they are going to share what they know with other people by drawing a cartoon about safe fires. Ask students if they have ever read cartoons in the newspaper, in books, or in magazines. Show them a cartoon that you cut out of the newspaper. Have them share the name of some of the cartoons that they read.

   As students share ideas, ask them to help you define what a cartoon is. Ideas should include:

   - A cartoon is a series of drawings
   - The drawings are in a sequence of "boxes"
   - Cartoons have characters
   - The characters interact with one another
   - The character's thoughts and ideas are written inside "bubbles"
   - Cartoons are shorter than stories
   - Some cartoons are funny
   - Some cartoons have good messages

2. Hand a copy of Student Page **3**, *How Do I Draw a Cartoon?* to each student. Have students read the cartoon and answer the question, "How Do I Draw a Cartoon?" You may wish to help students answer the question by asking them how many scenes the cartoon has, what the scenery shows, who the main characters are, and what happens to them.

   Once the class has discussed the question, tell them that there are three guidelines for creating a good cartoon. Write the following guidelines on the board. You may want to have students copy them on the back of the student page as well.

   - A cartoon is short (about three scenes with only one sentence per character per scene)
   - A cartoon has interesting, easily identifiable characters (e.g., cats and dogs)
   - A cartoon has a very clear message (e.g., don't play with matches)

3. Tell students that they are all going to create their own cartoons about fire safety. Tell the class that the first thing that they need to do is pick a fire message that they would like to help other people understand. Have students look back at the messages they wrote at the bottom of Student Page **2**, *Make It Safe!* for ideas.

4. Give each student a blank piece of paper and pencil. Have each student pick one message about which to write their cartoon. Have them write the message at the top of the page.

5. Next have students brainstorm what each scene is going to be about and identify the characters in it. Have students think about the different characters that they can choose from. Ideas can include real people (e.g., themselves, members of their family, friends, firefighters, police officers), animals (e.g., rabbits, dogs, birds) or made-up characters (e.g., Spider-Man, Pokémon). Encourage students to write their ideas down.

   You may wish to provide students with the following example:

   For a cartoon with the title "Share What You Know With Other People," scene 1 could be a child playing with matches, scene 2 could be Smokey Bear telling the child that playing with matches is very dangerous and could cause a bad fire that destroys a forest and all the animals in it, and scene 3 could be the child and Smokey walking through a forest full of animals.

6. Have students draw their cartoons in pencil. If time allows, have them add color to the cartoons. As students are working, walk around the room and help them come up with characters, develop scenes, and arrange the drawings in their scenes.

7. Before class is over, showcase some of the students' cartoons. Encourage students to go home and improve their cartoons. Ask them to be creative by thinking of a title, inventing characters, coloring, etc. Also remind them to share what they learned with their family.

FORESTERS IN THE CLASSROOM

Wisconsin Department of Natural Resources fire personnel make classroom visits. To find a staff member in your county, go on-line to *www.dnr.state.wi.us/staffdir/SearchCounty.asp*, click on your county, and type "fire" into the subject box.

SUMMATIVE ASSESSMENT

1. Tell students that Spider-Man is a comic book character who has superpowers that help him move like a spider. He uses them to fight crime. Ask students to talk about Spider-Man's superpowers and think of some superpowers that would help a superhero fight fires.

2. Have students create a cartoon comic book character that has superpowers for fighting fire. Have students create a history for the character and develop a fire safety message around the character.

RECOMMENDED RESOURCES

ACTIVITY GUIDES

FireWorks Curriculum: Featuring Ponderosa, Lodgepole, and Whitebark Pine Forests by Jane Kapler Smith and Nancy E. McMurray. (Fort Collins, CO: U.S. Department of Agriculture Forest Service, Rocky Mountain Research Station, General Technical Report RMRS-GTR-65, 2000.) The FireWorks Curriculum is a compilation of fire lessons for grades K-10. Some of the information is specific to western fire regimes but many of the activities convey basic information about fire safety and fire behavior that is useful for younger students. A free copy of the curriculum is available at *www.fs.fed.us/rm/pubs/rmrs_gtr65.html*. Workshop participation is required to obtain additional materials needed for some lessons.

Smokey and Friends: What You Can Do to Prevent Forest Fires by Lifetime Learning Systems, Inc. (2002). This booklet is a small but well organized and effective collection of Smokey Bear fire prevention activities. This and other Smokey resources are available for free at *www.smokeybear.com/resources.asp*.

Wildland Fire Primer: A Guide for Educators prepared by John Owen and Pat Durland. (Boise, Idaho: U.S. Department of the Interior Bureau of Land Management, National Interagency Fire Center, 2002.) The Wildland Fire Primer presents the concepts and messages that the National Interagency Fire Center determines necessary for effective wildland fire education. The guide is well organized and provides a comprehensive overview of the fundamentals of wildland fire education.

WEBSITES

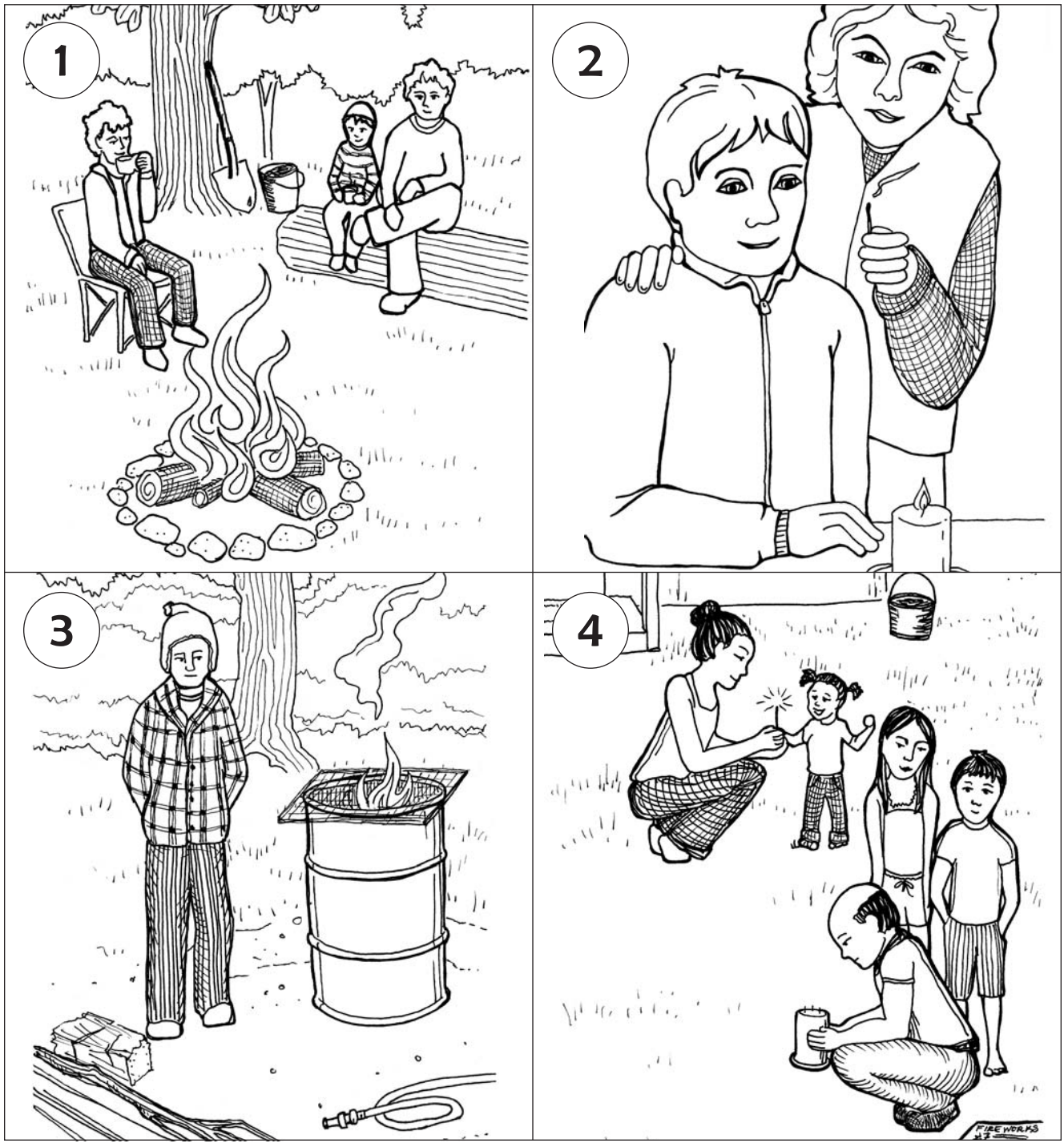
FEMA for Kids: Wildfires
www.fema.gov/kids/wldfire.htm
The Federal Emergency Management Agency provides links to a variety of classroom resources for fire prevention and fire safety.

Minnesota Department of Natural Resources Wildfire Prevention Education
www.dnr.state.mn.us/education/wildfire/index.html
The Minnesota DNR's wildfire prevention education page provides links to a variety of educational resources for teaching about fire prevention and the use of prescribed fire.

Project Learning Tree
http://plt.org
The Project Learning Tree website has a resources section featuring special initiatives including fire education. The fire initiative page includes links to a fire education curriculum, a glossary of wildland fire terms, and links to information on current wildland fire issues.

Wisconsin Department of Natural Resources Fire Prevention and Safety
www.dnr.state.wi.us/org/land/forestry/Fire/fire-ps.htm
The Wisconsin DNR fire prevention and safety page has links to fire statistics, issue summaries, and public service announcements.

MAKE IT SAFE! ANSWER KEY



THE FIRE TRIANGLE

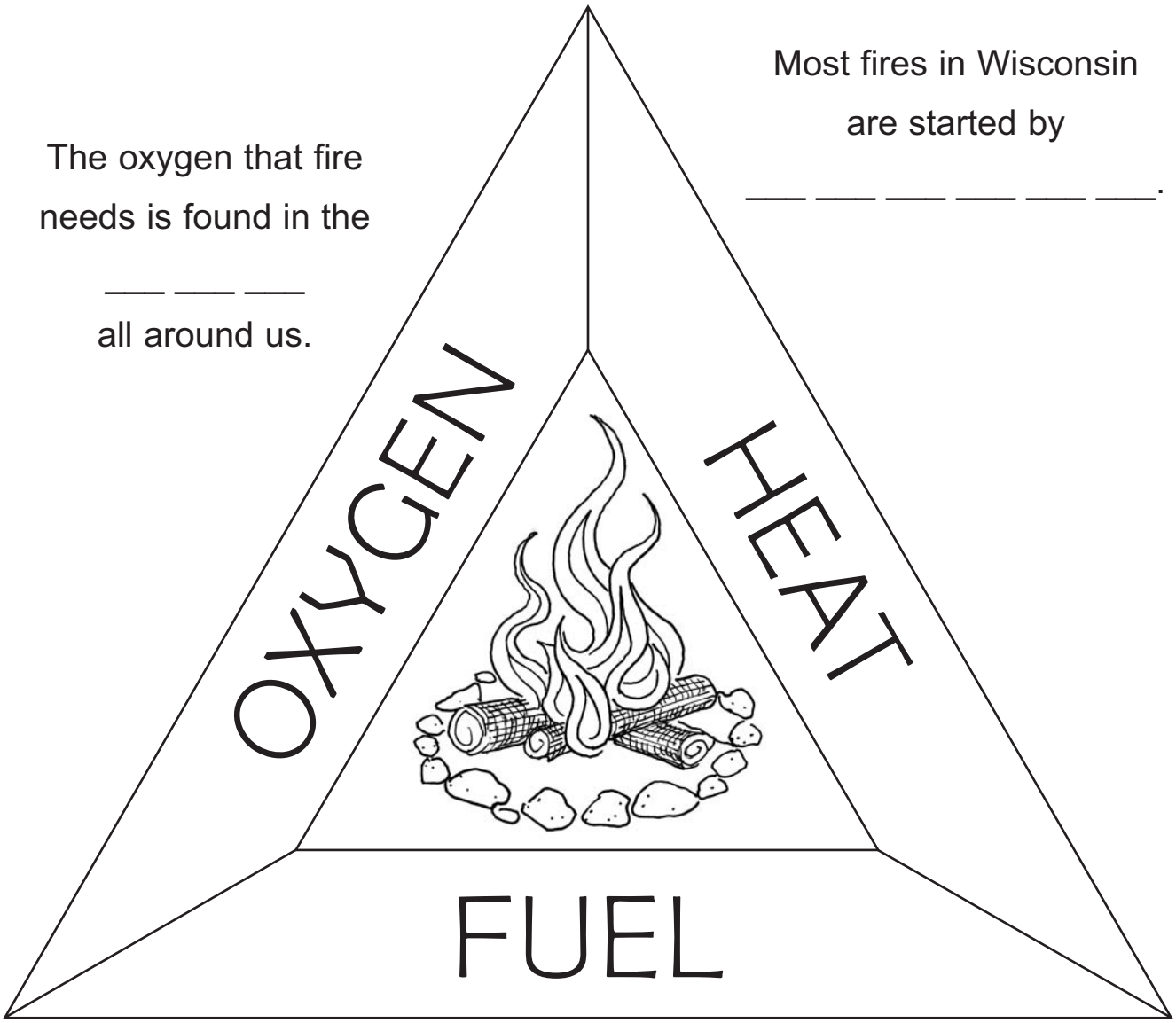
The oxygen that fire needs is found in the

___ ___ ___

all around us.

Most fires in Wisconsin are started by

___ ___ ___ ___ ___ ___.



List 4 different materials that can act as fuel.

1) _____

2) _____

3) _____

4) _____

MAKE IT SAFE!

HOW DO I DRAW A CARTOON?

Cartoons are very short stories. They make people laugh and send a message. They have three main parts: 1) characters, 2) words, and 3) scenery. Read the cartoon below and identify how the characters, words, and scenery are used to share the message – **Don't Play With Matches!**