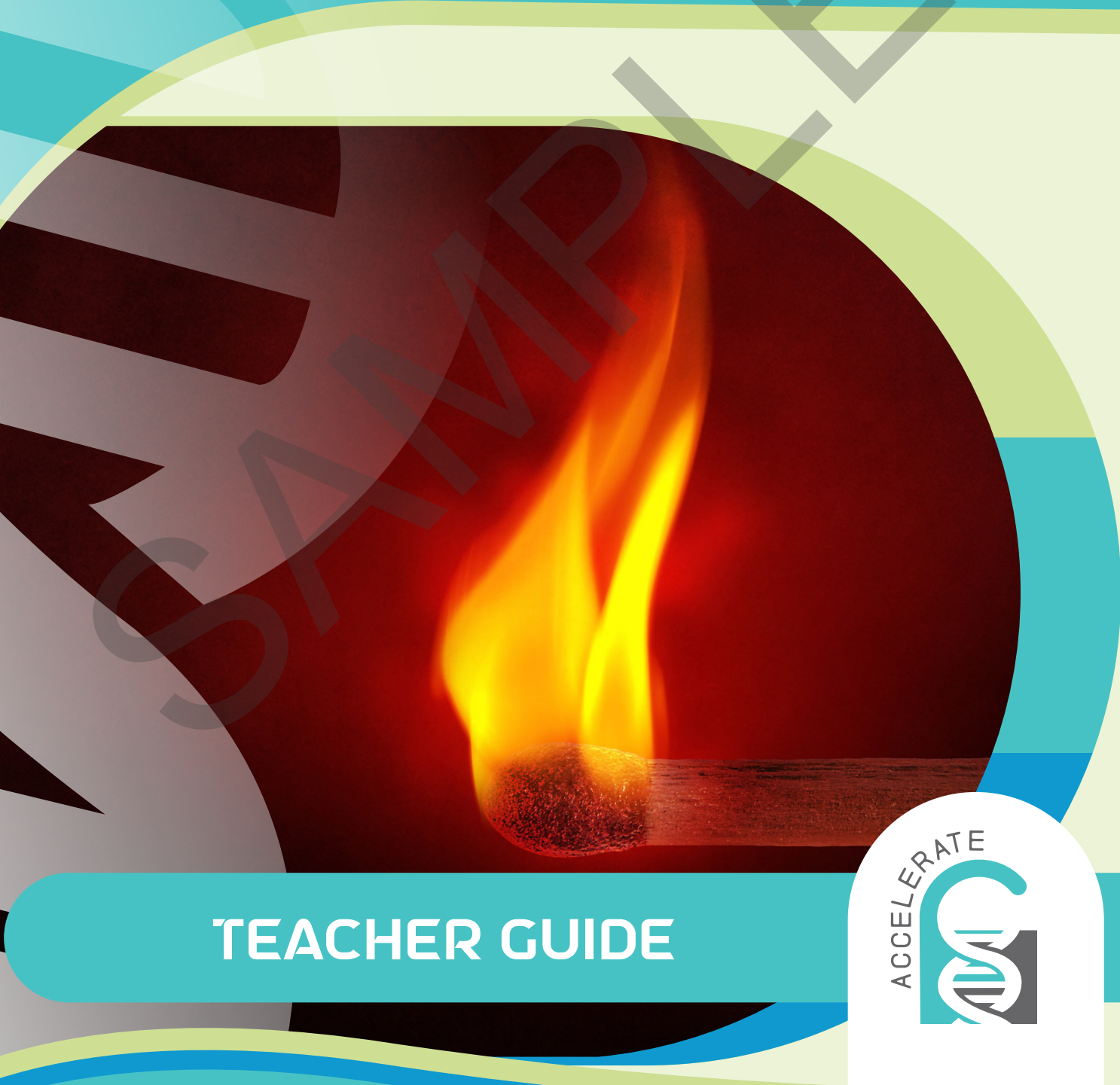


# WARM AND BRIGHT



TEACHER GUIDE

ACCELERATE



## PLANNING

Here's a suggested schedule for this kit! The activities should be completed in order, but you can choose when the lessons take place over time.

ACTIVITY INFORMATION	SECTION (S)	TIME REQUIRED	DAY/ LESSON
<b>ACTIVITY 1: BURSTING BALLOONS</b> Can water keep a balloon from popping? <b>Total time: 30 min</b>	<input type="checkbox"/> Will It Burst?	30 minutes	Day 1
<b>ACTIVITY 2: EXPLAINING THE EFFECT</b> Test different materials to see which will transfer thermal energy. <b>Total time: 2 h 15 min</b>	<input type="checkbox"/> Causing Change	30 minutes	Day 2
	<input type="checkbox"/> Materials Matter	60 minutes	Day 3
	<input type="checkbox"/> Explaining What You Find	45 minutes	Day 4
<b>ACTIVITY 3: KEEPING THE HEAT IN</b> Design and build your...	<input type="checkbox"/>		

SAMPLE

Full schedule available with purchase

# 2

## activity

# EXPLAINING THE EFFECT

Your student discovered in Activity 1 that with water in the balloon it would not pop when brought towards the flame. The balloon could even touch the flame and not pop. That's amazing! So, how does it work? In this activity, students will explore how the water and its temperature determined whether the balloon would pop. Then, they will test what they learn with other materials.

### LEARNING GOALS:

- ✓ I can design and evaluate a device that minimizes or maximizes thermal energy transfer.
- ✓ I can investigate temperature to find the relationships between energy transferred, type of matter, mass, and change in kinetic energy.

2

## CAUSING CHANGE

### CONTENT

- This section will introduce your student to energy, including the types and forms of energy relevant to this kit. Your student will also learn about energy transfer.
- Your student will learn the vocabulary term energy in this subsection.

### Types of Energy

- In this subsection, your student will learn the vocabulary terms kinetic energy and potential energy.

### Forms of Energy

- In this subsection, your student will learn the vocabulary terms thermal energy.

### Energy Transfer

- In this subsection, your student will learn the vocabulary terms energy transfer and Law of Conservation of Energy.

3

## MATERIALS MATTER

### SAFETY:

**WARNING!** Boiled water can cause burns to skin. Be careful not to touch boiling water or hot appliances. Avoid spills by using a stable container and surface.



### PREPARATION AND SUPERVISION

- Your student can test the different materials one at a time or all at once. If testing one at a time, make sure to boil water each time so the water starts at the same temperature.
- The chocolate bar is made in a facility that processes peanuts. If your student has a severe peanut allergy, alternatives are butter and coconut oil.
- To test if the chocolate is melting, your student can push on it gently to see if it runs, oozes, or slides.

### c. Radiation

**Answer:** Answers will vary.

#### How to Help:

- Any image your student provides where heat is moving through an empty space to warm another object is correct.
- Examples include heat from a lightbulb and the sun warming a specific object (not Earth as this was provided in the text).
- If your student uses an example related to a different form of radiation, such as x-rays, encourage them to think about how radiation is related to thermal energy, rather than thermoelectric radiation.

6

## INCREDIBLE INSULATOR

**WARNING!** Boiled water can cause burns to skin. Be careful not to touch boiling water or hot appliances. Avoid spills by using a stable container and surface.



### ✓ PREPARATION AND SUPERVISION

- It is important that your student's control is accurate. If you have time, have your student test their control 3–5 times to get an average. It will take approximately 30–45 minutes.
- You do not need to do this for the designs your student creates, but it is an option.

### MULTIPLE AGES AND ABILITIES:

There are two foam cups provided in the kit. If you are working with two students you can have each design their own device and compare. If you are working with more than two students, you can have them split into groups and have students work on cooperation skills by designing and building a device together.

### 💡 THINK ABOUT IT!

? **Question 1:** How did you take what you have learned and applied it to your first design?

**Answer:** Answers will vary.

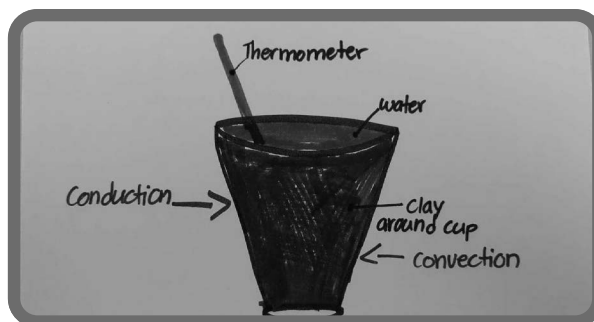
**How to Help:** Encourage your student to use their new vocabulary and connect the materials tested in Activity 2 to this experiment.

? **Question 2:** Draw and label a diagram of your first design. Include where heat transfer, convection, conduction, and radiation happened if they occur.

**Answer:** Answers will vary.

#### How to Help:

- Not all designs require the convection, conduction, and radiation labels. Make sure your student only included them if they are relevant.
- Here is an example image of a correct response.





© Home Science Tools. All rights reserved.  
*Reproduction for personal or classroom use only.*

Contact us at: [www.homesciencetools.com/customer-service/](http://www.homesciencetools.com/customer-service/)

A Product of Homesciencetools.com

Kit	SU-WRMBRI
Instructions	IN-WRMBRIT
Revision Date	9/2021