

**MIDDLE YEARS**

**SCIENCE**

***Activities*** for the  
**Differentiated**  
**Classroom**

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# *Activities* for the Differentiated Classroom

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### CHAPTER 1



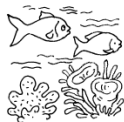
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# Index of Activities

This chart shows the standards that are covered in each chapter.

<b>SCIENCE AS INQUIRY</b>	<b>Standards are covered on pages</b>
Ability to conduct scientific inquiry	9, 19, 58
Understand about scientific inquiry	50, 91

<b>PHYSICAL SCIENCE</b>	<b>Standards are covered on pages</b>
Understand properties and changes of properties in matter	32, 39
Understand motions and forces	9, 19, 25
Understand transfer of energy	9, 19, 25

<b>LIFE SCIENCE</b>	<b>Standards are covered on pages</b>
Understand structure and function in living systems	76, 80
Understand reproduction and heredity	80, 83, 86, 91
Understand populations and ecosystems	71, 91
Understand diversity and adaptations of organisms	71, 83, 86

<b>EARTH AND SPACE SCIENCE</b>	<b>Standards are covered on pages</b>
Understand structure of the earth system	42, 50, 54, 58
Understand Earth's history	45, 50
Understand Earth in the solar system	64, 68

<b>SCIENCE AND TECHNOLOGY</b>	<b>Standards are covered on pages</b>
Identify abilities of technological design	9, 25, 29
Understand about science and technology	29, 91

<b>SCIENCE IN PERSONAL AND SOCIAL PERSPECTIVES</b>	<b>Standards are covered on pages</b>
Understand the importance of personal health	76
Understand populations, resources and environments	58, 71, 91
Identify natural hazards	45, 50, 54, 58
Understand risks and benefits	42, 50, 54, 58, 76, 91
Understand science and technology in society	25, 29, 54, 58, 91

<b>HISTORY AND NATURE OF SCIENCE</b>	<b>Standards are covered on pages</b>
Understand science as a human endeavour	29, 32, 64
Understand the nature of science	29, 58, 91
Understand the history of science	29, 50, 64

<b>UNIFYING CONCEPTS AND PROCESSES</b>	<b>Standards are covered on pages</b>
Understand systems, order and organisation	32, 39, 45, 54, 58, 64, 68, 71, 76, 80
Understand evidence, models and explanation	19, 25, 32, 42, 45, 50, 54, 58, 64, 71, 80, 91
Understand change, constancy and measurement	19, 54
Understand evolution and equilibrium	39, 45, 83, 86
Understand form and function	25, 39, 54, 76

## **Suggested Suitability of Activities by Year Level**

Book One through to Book Six are suitable for Year Prep through to Year 6, as shown in the table below, but this may vary slightly in your classroom.

The Middle Years books in this series are suitable for Year 6 to Year 9.

<b>BOOK</b>	<b>Year Level</b>
1	Prep/1
2	1/2
3	2/3
4	3/4
5	4/5
6	5/6
Middle Years: English	6–9
Middle Years: Science	6–9
Middle Years: Maths	6–9

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# Introduction

**A**s a teacher who has adopted the differentiated philosophy, you design instruction to embrace the diversity of the unique students in your classroom and strategically select tools to build a classroom where all students can succeed. This requires careful planning and a very large toolkit! You must make decisions about what strategies and activities best meet the needs of the students in your classroom at that time. It is not a “one size fits all” approach.

When planning for differentiated instruction, include the steps described below. Refer to the planning model in *Differentiated Instructional Strategies: One Size Doesn't Fit All, Second Edition* (Gregory & Chapman, 2007) for more detailed information.

1. Establish standards, essential questions and expectations for the lesson or unit.
2. Identify content, including facts, vocabulary and essential skills.
3. Activate prior knowledge. Pre-assess students' levels of readiness for the learning and collect data on students' interests and attitudes about the topic.
4. Determine what students need to learn and how they will learn it. Plan various activities that complement the learning styles and readiness levels of all students in this particular class. Locate appropriate resources or materials for all levels of readiness.
5. Apply the strategies and adjust to meet students' varied needs.
6. Decide how you will assess students' knowledge. Consider providing choices for students to demonstrate what they know.

Differentiation does not mean always tiering every lesson for three levels of complexity or challenge. It does mean finding interesting, engaging and appropriate ways to help students learn new concepts and skills. The practical activities in this book are designed to support your differentiated lesson plans. They are not pre-packaged units, but rather activities you can incorporate into your plan for meeting the unique needs of the students in your classroom right now. Use these activities as they fit into differentiated lessons or units you are planning. They might be used for total group lessons, to reinforce learning with individuals or small groups, to focus attention, to provide additional rehearsal opportunities, or to assess knowledge. Your differentiated toolkit should be brimming with engaging learning opportunities. Take out those tools and start building success for all your students!

# Earth Science

## Strategy

Choice board

## My Trip as a Drip

### Standards

Earth and Space Science—Understand structure of the earth system.

Science in Personal and Social Perspectives—Understand risks and benefits.

Unifying Concepts and Processes—Understand evidence, models and explanation.

### Objectives

Students will identify and describe parts of the water cycle, including alternative pathways.

Students will apply knowledge of the water cycle by writing a creative story about a water droplet.

### Materials

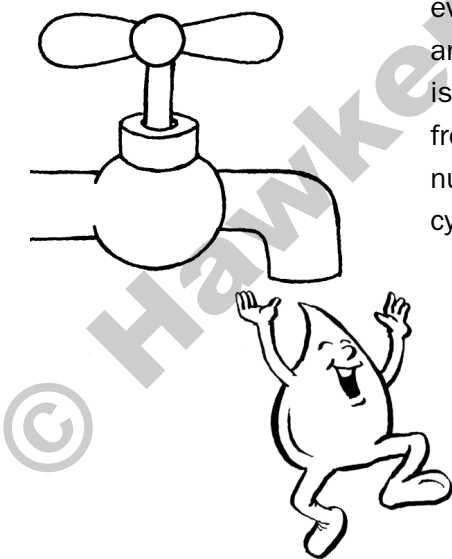
My Trip as a Drip activity

science notebooks

dice

Our hydrosphere consists of all water found on, under and over the surface of Earth. The movement of water in the hydrosphere is called the *water cycle*. The water cycle is often depicted as a circular pathway—water evaporating from the ocean, condensing into clouds, precipitating onto land, and then flowing back into the ocean to repeat the process again. While this is one path that a water droplet may take, it is not the only way water gets from one location to another. In this activity, students learn that there are a number of alternative routes water can take as it travels through the water cycle.

1. Have students answer the following questions in their science notebooks: *Where is water found on Earth? Where does water come from? How does water get from one place to another on Earth?* Have students discuss their answers with a partner before sharing their answers aloud. Prompt students to identify parts of the water cycle and name different places where water is found (*glaciers, oceans, river, lakes, clouds, soil, plants, animals and groundwater*). Help them understand that the water we drink has to come from somewhere else.



When our bodies are finished using the water, it will be used another way in the water cycle. This is also a good opportunity to discuss how water pollution can affect the water cycle and the planet as a whole.

- Distribute copies of **My Trip as a Drip activity (page 44)**, and explain to students that they will be describing a water droplet travelling through the water cycle. Show students how to choose one task from this choice board to complete. Allow adequate time for students to complete the project.
- Invite students to share their finished products with the class. Encourage peers to ask questions and provide feedback about each presentation.

### Ideas for More Differentiation

- Beginning Mastery:** Have students list and compare the different ways living things (plants, animals, humans) depend on water every day.
- Approaching Mastery:** Have students discuss what would happen to a community if its water supply became contaminated. Have them research a source of water pollution in their community and propose a way to eliminate that source of pollution.
- High Degree of Mastery:** Have students research the instruments used to measure rainfall and how scientists use cloud seeding to produce rain during droughts. Have them write a report about their findings and/or present a demonstration of these methods.

Name \_\_\_\_\_ Date \_\_\_\_\_

### My Trip as a Drip

Directions: Choose one of the following tasks to explain how a water droplet travels from place to place. Be creative!

Write a story, poem or song about your trip through the water cycle.	Draw a cartoon drip, depicting your trip through the water cycle.	Create a poster showing how you got from one place to another.
Interview another water droplet about its travels through the water cycle. Present your interview to the class.	Free! Choose!	Write and present a play about your journey as a water droplet.
Sing a song about your trip as a drip.	Design a life-sized maze depicting your path through the water cycle.	Create a game about the water cycle.

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**My Trip as a Drip Page 44**



# Article Analysis

Title: _____	Author: _____
Source: _____	Date Published: _____

1. **What** is the main idea of this article?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

2. **Who** was involved in the situation?

\_\_\_\_\_

3. **Where** and **when** did it happen?

\_\_\_\_\_

4. **How** was the situation resolved?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

5. **Why** do you think this article was written? Do you agree with the author? Why?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## Important Vocabulary Words from the Article

Word: \_\_\_\_\_ Definition: \_\_\_\_\_



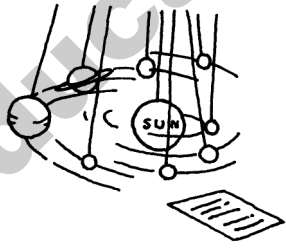
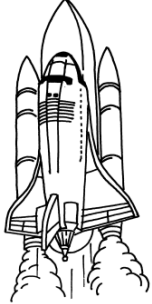
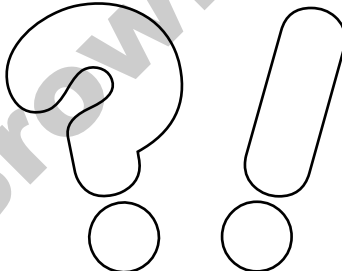
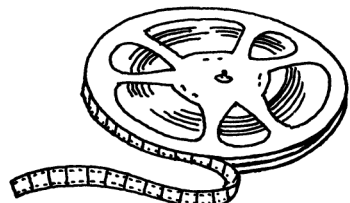


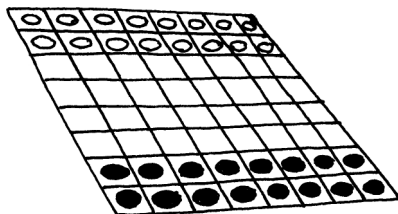
Word: \_\_\_\_\_ Definition: \_\_\_\_\_

Word: \_\_\_\_\_ Definition: \_\_\_\_\_



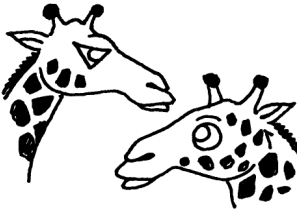


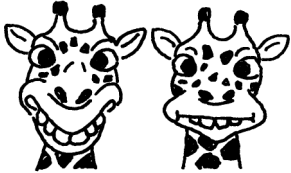






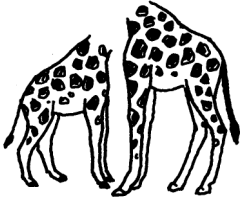
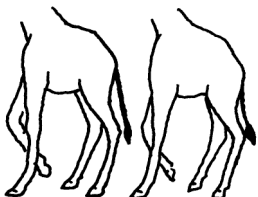
# Solar System Choice Board

**Directions:** Complete at least three assignments from the choice board.

<p>Write a real or fictitious interview with an astronaut. Include at least ten questions and answers about the space program and space travel.</p> 	<p>Write a fictional story or diary entries about space travel near, through or inside a black hole.</p> 	<p>Use computer graphics or art supplies to make a model of the solar system. Include labels and description cards.</p> 
<p>Draw a diagram or make a model of your own space shuttle. Include labels and descriptions.</p> 	<p>Your choice! Let's talk about it!</p> 	<p>Create a poster for a movie about space exploration. Include planets, the sun, the moon, and other celestial bodies.</p> 
<p>Write a news article about the Parkes Satellite Dish in NSW. Include a message you would like to send from that device.</p> 	<p>Create a children's book or comic book about riding on a comet in space. Include facts about a famous comet.</p> 	<p>Create a solar system board game with fact cards about planets and other celestial bodies.</p> 

# Giraffe Traits

**Directions:** Complete this chart to help you determine what your baby giraffe will look like for *Giraffe Genetics*. Remember, the genotype for each trait is a combination of two alleles for that gene, one from each parent. Uppercase letters stand for dominant alleles; lowercase letters stand for recessive alleles.

<p><b>Eye Shape</b></p>  <p>Circle (C) Triangle (c)</p>	<p><b>Eye Colour</b></p>  <p>Green (G) Blue (g) (colour me) (colour me)</p>
<p><b>Ear Shape</b></p>  <p>Round (E) Pointed (e)</p>	<p><b>Mouth Shape</b></p>  <p>Curved (V) Straight (v)</p>
<p><b>Freckles</b></p>  <p>Present (F) Absent (f)</p>	<p><b>Nose Colour</b></p>  <p>Pink (P) Black (p) (colour me) (colour me)</p>
<p><b>Neck Length</b></p>  <p>Long (N) Short (n)</p>	<p><b>Mane Length</b></p>  <p>Short (M) Long (m)</p>
<p><b>Mane Style</b></p>  <p>Curly (S) Straight (s)</p>	<p><b>Mane Colour</b></p>  <p>Black (B) Brown (b) (colour me) (colour me)</p>
<p><b>Leg Length</b></p>  <p>Long (L) Short (l)</p>	<p><b>Hide Colour</b></p>  <p>Tan (T) Yellow (t) (colour me) (colour me)</p>