Book 6

ENGAGE THE BRAIN GAMEs

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EDUCATION

ENGAGE THE BRAIN GAMEs Book 6

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Index of Activities

This chart shows the standards covered in each chapter.

ENGLISH	Standards are covered on pages
Read a wide range of print and nonprint texts to build an understanding of texts, of self, and of the cultures of Australia and the world; to acquire new information; to respond to the needs and demands of society and the workplace; and for personal fulfilment (includes fiction and nonfiction, classic and contemporary works).	18
Read a wide range of literature from many periods in many genres to build an understanding of the many dimensions (e.g. philosophical, ethical, aesthetic) of human experience.	25
Apply a wide range of strategies to comprehend, interpret, evaluate and appreciate texts. Draw on prior experience, interactions with other readers and writers, knowledge of word meaning and of other texts, word identification strategies and understanding of textual features (e.g. sound-letter correspondence, sentence structure, context, graphics).	20, 28
Adjust the use of spoken, written and visual language (e.g. conventions, style, vocabulary) to communicate effectively with a variety of audiences and for different purposes.	22
Employ a wide range of strategies while writing, and use different writing process elements appropriately to communicate with different audiences for a variety of purposes.	11
Apply knowledge of language structure, language conventions (e.g. spelling and punctuation), media techniques, figurative language and genre to create, critique and discuss print and nonprint texts.	9, 14

MATHEMATICS	Standards are covered on pages
Number and Operations—Understand numbers, ways of representing numbers, relationships among numbers and number systems.	29, 31, 34
Number and Operations—Compute fluently and make reasonable estimates.	38, 45
Geometry—Use visualisation, spatial reasoning and geometric modelling to solve problems.	47
Measurement—Apply appropriate techniques, tools and formulas to determine measurements.	36
Problem Solving—Apply and adapt a variety of appropriate strategies to solve problems.	41

SCIENCE	Standards are covered on pages
Physical Science—Understand properties and changes of properties in matter.	65
Physical Science—Understand motions and forces.	50
Life Science—Understand structure and function in living systems.	60
Life Science—Understand diversity and adaptations of organisms.	59
Earth and Space Science—Understand structure of the earth system.	55
Earth and Space Science—Understand Earth in the solar system.	57
Science in Personal and Social Perspectives—Identify natural hazards.	61
Unifying Concepts and Processes—Understand systems, order and organisation.	53

SOCIAL STUDIES	Standards are covered on pages
Understand culture and cultural diversity.	81, 84
Understand the ways human beings view themselves in and over time.	68
Understand the interactions among people, places and environments.	71, 82
Understand how people organise for the production, distribution and consumption of goods and services.	73
Understand relationships among science, technology and society.	79
Understand how people create and change structures of power, authority and governance.	76

Suggested Suitability of Activities by Year Level

Book One to Book Six are suitable for 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.

BOOK	YEAR LEVEL
1	Prep/1
2	1/2
3	2/3
4	3/4
5	4/5
6	5/6
Middle Years: English, Maths, Science, Social Studies	6–9

Introduction

An ancient Chinese proverb claims: "Tell me, I forget. Show me, I remember. Involve me, I understand." This timeless saying insinuates what all educators should know: Unless students are involved and actively engaged in learning, true learning rarely occurs.

The latest brain research reveals that both the right and left hemispheres of the brain should be engaged in the learning process. This is important because the hemispheres talk to one another over the corpus callosum, the structure that connects them. Using learning games is a valid and important teaching strategy. The mechanisms involved when students are playing a game are just as cognitive as when students are doing maths classwork (Bjorkland & Brown, 1998). Furthermore, it is known that play speeds up the brain's maturation process since it involves the built-in processes of challenge, novelty, feedback, coherence and time (Jensen, 2001).

How to Use This Book

The activities in this book cover the content areas and are designed using strategies that actively engage the brain. They are presented in the way the brain learns best to make sure students get the most out of each lesson: focus activity, modelling, guided practice, check for understanding, independent practice and closing. Go through each step to ensure that students will be fully engaged in the concept being taught and understand its purpose and meaning.

Each step-by-step activity provides a game that students can use to reinforce learning. Students will enjoy playing variations of classic games such as relay races, Simon Says, Bingo Tag, scavenger hunts, mazes, and more!

Games can be fun, lively and spirited. The little bit of extra effort it takes to implement games into your curriculum will reap loads in student involvement. You can expect high emotion, healthy rivalry and exhilarating debate. Thus set firm ground rules when playing any classroom game. Watch as once-disinterested students transform before your eyes. These brain-compatible activities are sure to engage and motivate every student's brain in your classroom! Watch students progress from passive to active learners as they process competitive, exciting games into learning that is not only fun but also remembered for a lifetime.

Plane Old Estimation

Materials
- Plane Old Estimation activity
- coloured project paper
- different-coloured paper
- measuring tape

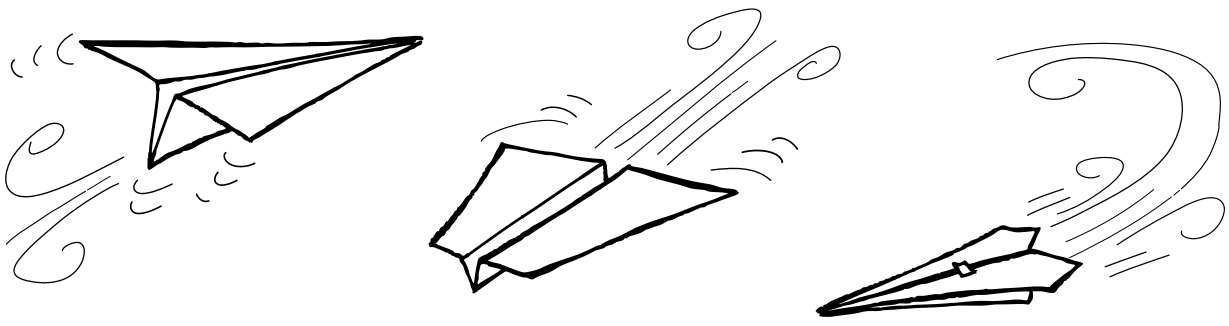
Objective

Students will predict flight distances based on their knowledge of scientific principles.

Students love to make paper planes, so let them! Paper planes are perfect tools for demonstrating forces such as gravity, friction and aerodynamics, and they are great motivators. When you combine paper planes and competition, the result is a learning experience to be remembered.

1. Fold a paper plane and show it to the class. Ask students to predict how far they think it will fly. Encourage them to list aspects of the plane that they think will help or hinder its flight.
2. Present information on the principles you want the game to demonstrate. Planes offer excellent visuals for teaching weight, gravity, friction, aerodynamics, measurement, observation and estimation. Facilitate a discussion on how planes demonstrate your principle.
3. Divide the class into teams of five, and give each team member a piece of different-coloured project paper. Give each team a copy of the **Plane Old Estimation activity sheet (page 52)**. Point out the different styles of paper planes shown. In addition, you may choose to display several real examples or allow students to explore websites that offer step-by-step instructions. Check out *http://www.wannalearn.com/Just_for_Fun/Making_Paper_Airplanes/* and *www.bestpaperairplanes.com*. Then invite each student to construct his or her own paper plane.
4. Inform students that they will be playing a game wherein they receive points based on how well teams estimate the distance their planes will fly. Before you proceed with the game, invite teams to think of a creative team name.
5. Explain that each team will use one plane per round. First, they predict how far they think their planes will fly. They will receive points based on the accuracy of their predictions for each round. Provide an example for students: *Team 1 may choose to use their blue plane for round one. They reach a consensus that the plane will fly five metres. They list **5 metres** as their prediction for that round on the activity sheet. Team 1 is then ready to fly their plane and measure its flight distance.*

6. Inform students that each team begins with 100 points. They must subtract the number of metres they were off in their predictions for each round. For example, if they predict their plane will fly four metres and it flew five metres, they would subtract one point from their total score. The team with the highest score at the end of five rounds wins the game.
7. Model one round using your plane. Prompt teams to confer and write an estimate for how many metres they think the plane will fly. Fly your plane and have students subtract their predicted number of metres from the actual number of metres flown. Students then subtract that number from 100 and record their score. While this round will not count toward the final total, check team calculations to ensure they understand the process.
8. Begin the game with round one. Invite teams to select the coloured plane they will use first, make their estimations, and fly the plane. They then measure the flight, record the measurement and subtract the appropriate number of points. Continue for four more rounds.
9. During the game, circulate around the room to make sure students are estimating *prior* to the flights. It is up to you whether or not teams can proceed with a round as soon as they finish or must wait until all teams are ready to move on.
10. To close the activity, ask individual students or teams to write a paragraph explaining the strategies they used in the game and how scientific principles were exemplified.

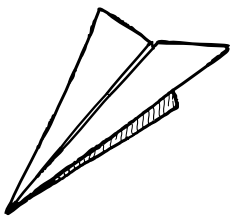


Name _____ Date _____

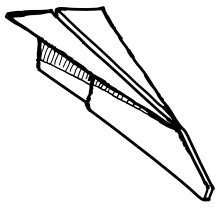
Plane Old Estimation

Directions: Build five paper planes using the examples below to help you. Estimate how far you think each plane will fly, and fly the plane. Record your estimations and actual distances in the chart. Then calculate your points.

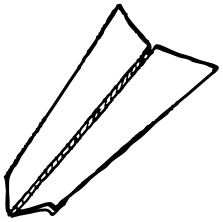
Plane Colour	Estimation	Actual Distance	Points (100)
Total			



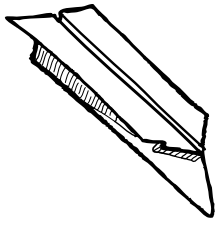
Needle Nose



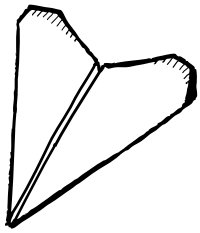
Blunt Nose



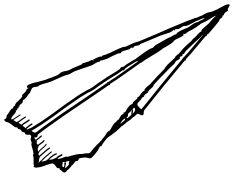
Distance Dart



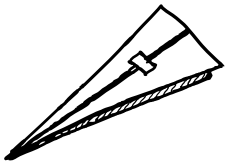
Fearless Flier



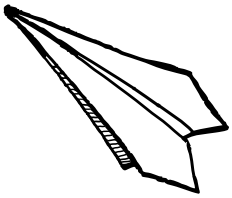
Moth Wing



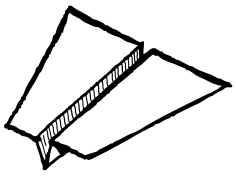
Torpedo



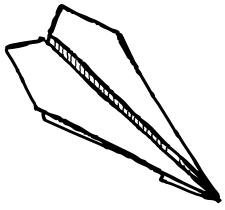
Fast Floater



Soaring Star



Trapezoid Wing



Air Catcher

Capital Clues

Objective

Students will recall state capitals based on clues.

Materials
- index cards

State capitals are examples of facts students memorise to get through a test and then forget. One reason for this memory loss could be that students memorise capitals as isolated facts. If you allow students to make further connections about each capital city, it will enhance retention. Capital Clues motivates students to learn and recall numerous facts about each state capital.

1. Write several facts about your state capital on the board. Do not include anything about its status as capital or its name. Solicit guesses regarding the name of the city, but do not reveal the answer.
2. Tell students they will be learning more about state capitals in order to play a game. Split the class in half and have each team research five facts about each state capital and list them on index cards. The name of the capital should be on one side of the card and the facts should be on the other side. The state in which the capital is located may be included as the final fact.
3. Allow students to review and quiz each other using their fact cards, and then hand in the cards to you. Tell students they will be competing with the other team to name each capital using the fewest number of clues. To start each round, you will draw an index card from the shuffled stack and indicate in what region of the country the city is located.
4. Teams then predict how many clues they will need to guess the city. The team who thinks they can name it using the fewest number of clues has a chance to hear that number of clues and then guess the capital. If they are correct, they receive a point. If they are incorrect, the other team has a chance to hear all five clues and guess the capital to earn the point. The team with the highest number of points at the end of the game wins.
5. Model a practice round with students. Choose a card from the stack and tell students the region in which the capital is located. Ask team leaders to respond by saying: *We can name that capital in _____ clues*. The team with the lowest number gets a chance to answer first. Read that number of clues. Only give the name of the state as a fifth and final clue. Award points or give the other team a chance to answer.
6. During the game, keep track of the points on the board. Use your discretion regarding which facts you read from the card.

7. Close the activity by having students look back at the clues you presented in the opening of the lesson. Reveal that the facts are about their own state capital.

Variation of the Game

Capital Clues can also be played using other events or people covered in social studies. Students can research facts about the events and then compete to name the events using the fewest number of clues.

Extended Learning

Invite students to make flags for all 6 states. Encourage them to include symbols that represent some of the clues from the game. Display flags around the room, and invite the class to guess which flag represents each state.

A-maze-ing Expeditions

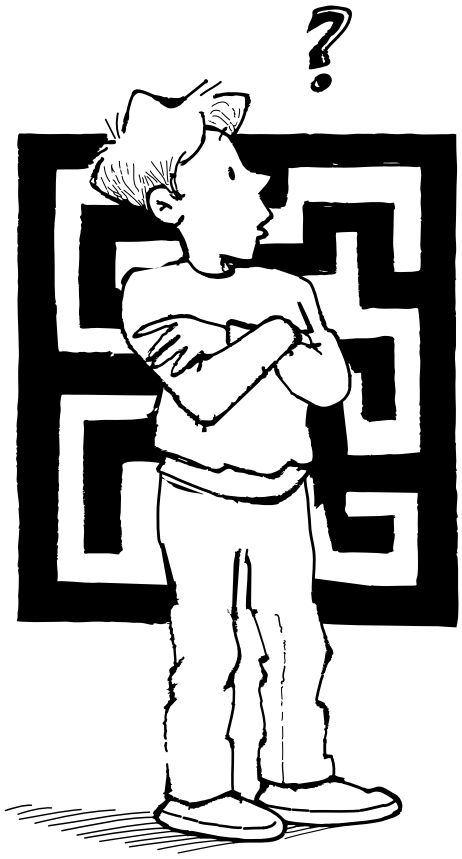
Materials
- A-maze-ing Expeditions activity
- rulers
- coloured pencils, textas
- overhead projector and transparency

Objective

Students will create mazes based on early Australian explorers and explorations.

When explorers begin an expedition they step out into the unknown. A thrill of exhilaration comes from finding answers to mysteries. Mazes offer that same kind of experience. For centuries, lifesize and paper mazes have piqued the interest of adults and children alike. Use this same idea to motivate students to learn about the exploits of famous explorers in Australian history.

1. Display a copy of the **A-maze-ing Expeditions activity sheet (page 83)** on the overhead projector. Tell students they will get to play with mazes, but they are going to have to work for it.
2. Review examples of explorers and expeditions in Australian history that you have already studied. You can either review several expeditions or you can have students focus on one you are currently studying.
3. Tell students that they will create mazes for their classmates. Each maze must tell the story of an explorer and one of his or her expeditions. Show the activity sheet again as an example. Demonstrate how the maze shows the beginning and end of the journey, as well as major points along the way. Students will be responsible for creating similar mazes for their peers.
4. Distribute materials needed for the assignment. Students may work in pairs if they wish. Suggest that they take notes on the explorer and expedition of choice before beginning the maze. Assist students as needed.
5. Make photocopies of students' mazes and distribute them randomly to the class. Invite students to work the puzzles.



Extended Learning

Instruct students to create a timeline of the major events in the expedition they researched as independent practice.

A-maze-ing Expeditions

Eyre and Baxter Expedition

Begin June 1840 from Adelaide.

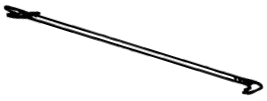
Reached Lake Torrens. Decided to go south again due to inhospitable desert.

Baxter sails to Streaky Bay.

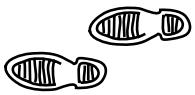
Eyre rejoins Baxter and they decide to head west.

Brave icy conditions and nearly die.

Baxter murdered by natives and provisions stolen.



Eyre struggles west alone for over a month with little food or water.



Eyre sighted by French boat that gave him food and water.

Finds water at what is now Eucla – first white man to see the Nullarbor cliffs from the land.

Eyre travels through heavy rain and cold weather.

Reach Albany in WA!