

# Contents

---

<i>Introduction</i> . . . . .	<i>v</i>
<i>Project Skills Chart</i> . . . . .	<i>vii</i>
<i>Project Assessment Rubric</i> . . . . .	<i>viii</i>
Energy Audit . . . . .	1
Choosing How to Save . . . . .	28
How to Green Your School . . . . .	45
Finding the Best Player . . . . .	69
Changing Communities . . . . .	85
Affording Fun . . . . .	105
Hottest Jobs . . . . .	130
Not As Hot As It Feels . . . . .	145
Growing Gardens . . . . .	165

# Introduction

---

Students learn effectively when they have an opportunity to apply their knowledge to real-life problems. This book contains ten expeditions that engage students in real learning. Expeditions typically have greater scope and complexity than the usual classroom project. They are bigger, more ambitious undertakings which, in turn, offer opportunities for greater student engagement and more profound learning. Each expedition links students to a bigger issue in their community. It illustrates to them how their education has relevance in their lives today and in the future. Each expedition strives to give students new skills that can help them both inside and outside the mathematics classroom. Many of them encompass other content areas, allowing students to exchange knowledge between English, science, geography, history and art.

*Expeditions in Your Classroom: Mathematics, Middle Years* provides activities and materials that scaffold student tasks, set clear criteria for final products, and offer assessment tools and a detailed outline of project steps. You will need to spend time with these materials in order to get a sense of each expedition and all of its components. Each expedition provides accessible routes to understanding for a broad audience of students.

Given the scope of each expedition, advance preparation is critical to successful implementation. As you prepare materials for each expedition, consider the needs of your classroom. You may wish to print out the student pages as a packet to give in its entirety to students, rather than hand them out in the suggested order. This will streamline your preparation time, as well as allow students who complete activities ahead of time to move on to the next phase.

## About Project-Based Learning

In *Real Learning, Real Work*<sup>1</sup>, Adria Steinberg describes the qualities of powerful projects: the six A's.

### Authenticity

Students solve problems and questions that are meaningful and real. People outside school walls tackle the same challenges. What students create and do has value beyond school.

### Academic Rigour

Students encounter challenging material and learn critical skills, knowledge and habits of mind essential for success in one or more disciplines.

### Applied Learning

Students put their knowledge and skills to work in hands-on ways, and learn how to organise and manage themselves along the way.

### Active Exploration

Students go into the field. They investigate and communicate their discoveries.

<sup>1</sup>Steinberg, Adria. *Real Learning, Real Work (Transforming Teaching)*. New York, NY: Routledge, 1998.

# Project Skills Chart

Projects always challenge students to flex more than one mental muscle at a time and integrate skills they often see dissected and covered in discrete units of study. Each project in this book has a core skill focus but also gives students an opportunity to practise other skills. Use this chart as a reference to help you find the best project for your needs.

C = Core skill

X = Other skills covered (sometimes optional)

Project	<i>Numbers and operations</i>	<i>Algebra</i>	<i>Geometry</i>	<i>Measurement</i>	<i>Data analysis and probability</i>	<i>Problem solving</i>	<i>Reasoning and proof</i>	<i>Communications</i>	<i>Connections</i>	<i>Representation</i>
Energy Audit		C			X	X	X			
Choosing How to Save	C					X		X		X
How to Green Your School			X		C	X		X		X
Finding the Best Player	X				C	X	X		X	
Changing Communities	C				C	X	X		X	X
Affording Fun		C				X	X			X
Hottest Jobs					C	X		X		X
Not As Hot As It Feels		C				X	X		X	
Growing Gardens			C	C		X				X

# Finding the Best Player

---

## Suggested Steps

### Preparation

- Review all the materials and activities for the expedition.
- You may wish to have students share their reports with the school's football coaches. If so, contact the coaches to get their involvement in the process.
- Ask students to begin bringing in news clippings about football that have statistics in them.
- If students are unfamiliar with football, have them do some reading or visit a website to learn more about it.
- Bookmark the following Yahoo! Sports webpage for Australian Football League goal kicking statistics: <http://au.sports.yahoo.com/afl/stats/?sort=goals>. Students will begin the project by looking at the sortable stats for leaders in goal kicking in the AFL. (Be sure you are looking at the list of the past season.) You may choose to print the needed information, or project it for classes without access to student computers.
- Bookmark the following Yahoo! Sports webpage for Australian Football League disposal statistics: <http://au.sports.yahoo.com/afl/stats/?sort=disposals>. You can click on players to view their individual statistics.

### Day 1

1. Have students complete a quick-write, a short 5-minute written response to the following prompt: What makes a sports player great?
2. Have students share their ideas with the class.
3. Discuss the fact that consistency – always playing above average – is an important characteristic of great sports players.
4. Distribute **Before You Go: Above Average** and **Expedition Tool: Finding the Best Player**.
5. Project or distribute the data from the Yahoo! AFL statistics website.
6. The Expedition Tool describes the various statistics that are calculated. Tell students to have this available for quick reference.
7. The list of players is sorted by the amount of goals they have kicked; one of the most important statistics for AFL players.
8. Have students identify what the range is in disposals for the first ten players in the second list. This will vary from year to year, in 2010 the range was 661–820.
9. Have students copy the statistics for the top five players.
10. Ask students which other statistics besides goal kicking would be most important to coaches looking for new players.

