Environmental Science Institute
THE UNIVERSITY OF TEXAS AT AUSTIN

2275 Speedway, Mail Code C9000
Austin, TX 78712
(512) 471-5847
www.esi.utexas.edu

Great Barrier Math

Subject: Mathematics
Grade Level: 5-7
Rationale or Purpose: This activity explores fractions, percentages, and metric conversions
Materials:

- Pencil/Paper
- Metric to English conversion charts
- Calculators if allowed

Lesson Duration: 15-20 minutes; additional discussion of Great Barrier Reef facts and issues is encouraged

Objectives:

5th Grade Math 111.17
(3B) use multiplication to solve problems involving whole numbers
(3C) use division to solve problems involving whole numbers
(4A) round whole numbers and decimals through tenths to approximate reasonable results in problem situations
(14A) identify the mathematics in everyday situations

6th Grade Math 111.22
(2C) use multiplication and division of whole numbers to solve problems including situations involving equivalent ratios and rates
(3A) use ratios to describe proportional situations
(3B) represent ratios and percents with concrete models, fractions, and decimals; and
(3C) use ratios to make predictions in proportional situations.
select and use appropriate units, tools
(6B) formulas to measure and to solve problems involving length (including perimeter and circumference), area, time, temperature, capacity, and weight
(6D) convert measures within the same measurement system (customary and metric) based on relationships between units.
(10C) sketch circle graphs to display data
(11A) identify and apply mathematics to everyday experiences, to activities in and outside of school, with other disciplines, and with other mathematical topics
(12A) communicate mathematical ideas using language, efficient tools, appropriate units, and graphical, numerical, physical, or algebraic mathematical models
(12B) evaluate the effectiveness of different representations to communicate ideas

7th Grade Math 111.23
(1B) convert between fractions, decimals, whole numbers, and percents mentally, on paper, or with a calculator
(2A) represent multiplication and division situations involving fractions and decimals with concrete models, pictures, words, and numbers
(3A) estimate and find solutions to application problems involving percent
(3B) estimate and find solutions to application problems involving proportional relationships such

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as similarity, scaling, unit costs, and related measurement units
(13A) identify and apply mathematics to everyday experiences, to activities in and outside of school, with other disciplines, and with other mathematical topics
(14A) communicate mathematical ideas using language, efficient tools, appropriate units, and graphical, numerical, physical, or algebraic mathematical models

Questions and Tasks:
The Great Barrier Reef (GBR) is located along the Queensland Coast of Australia. It stretches a length of 2,012 km and covers 349,623 km^2. Its reefs can reach heights up to 180m in some places.

1. How many square meters does the GBR cover?
2. How many square miles does the GBR cover?
3. How many square feet does the GBR cover?
4. How many meters long is the GBR?
5. How many miles long is the GBR?
6. How high can some corals grow in the GBR in feet?

One-third (about 33.3%) of Australia's Great Barrier Reef has been declared as "no-take" zones (protected from collecting, fishing, and damaging activities). One-third of the GBR is about the size of half the state of Texas! The Great Barrier Reef can be seen from space!

1. How many square km of the entire reef is protected as no-take?
2. How many square km of the entire GBR is not protected?
3. What percentage of the GBR is not protected?
4. Sketch a simple circle graph showing percent protected and percent not protected.

References and Resources:

- *Hot Science – Cool Talks #41, "Brave New Ocean", Dr. Jeremy Jackson,* www.hotsciencecooltalks.org
- Great Barrier Reef Marine Park, www.gbrmpa.gov.au