Unit 3: Logic and Reasoning Lesson 3.1

Game On!

(4) 1. Tyson was working with square numbers. He noticed a pattern for squaring consecutive numbers that end in 5.

5^2	15^2	25^2	35^2
25	225	625	1225

a. Identify a pattern in the table.

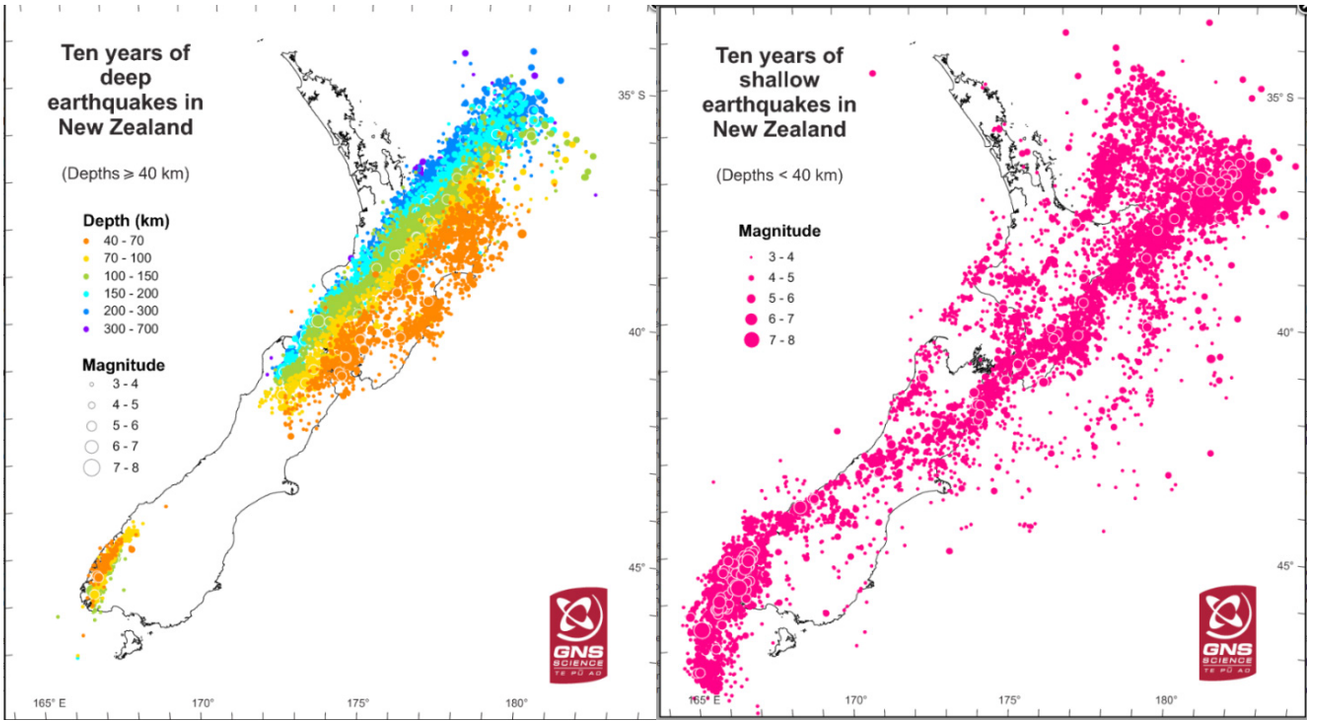
b. Make a conjecture based on the pattern identified.

c. Test the conjecture.

d. Explain whether or not the conjecture will always work.

(3)

2. State three conjectures based on the information in the diagrams.



(4)

3. Farmers, or others who rely on the weather to earn a living, often look for weather trends or patterns that will help them make decisions about their business. Consider the following conjecture:

Rain will occur 90 days following a foggy day.

a. How might this conjecture have been developed?

b. How could this conjecture be tested?

c. Ask a family member or explore the internet to find another weather predictor of this nature. Explain how the weather conjectures may have developed.

d. Explain how accurate this conjecture may be.

(4)

4. Three conjectures are listed below.

- All quadrilaterals with 4 equal sides are squares.
- All numbers ending in 0 are divisible by 5 and 25.
- A number multiplied by itself will result in a number larger than the starting number.

a. Show that each conjecture is false by providing a counterexample. Explain.

b. Select one conjecture from the list. Modify it so it becomes true.

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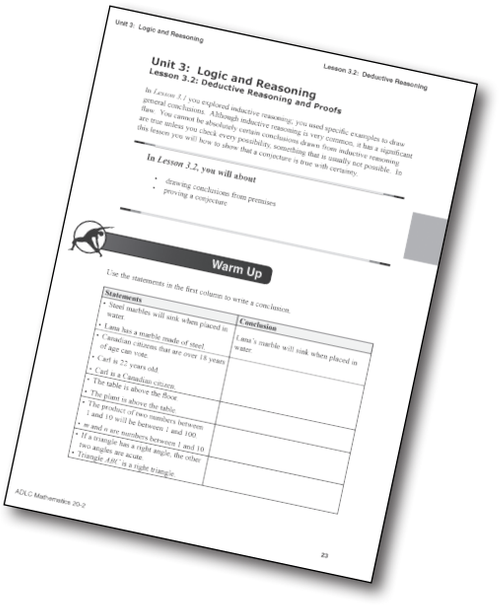
You have completed *Lesson 3.1 Game On!*. Please return to the *Module* and continue your training with *Lesson 3.2*.


Unit 3: Logic and Reasoning

Lesson 3.2: Deductive Reasoning

Unit 3: Logic and Reasoning
Lesson 3.2: Deductive Reasoning and Proofs

In *Lesson 3.1* you explored inductive reasoning; you used specific examples to draw general conclusions. Although inductive reasoning is very common, it has a significant flaw. You cannot be absolutely certain conclusions drawn from inductive reasoning are true unless you check every possibility, something that is usually not possible. In this lesson you will how to show that a conjecture is true with certainty.

In *Lesson 3.2*, you will about

- drawing conclusions from premises
- proving a conjecture

Warm Up

Use the statements in the first column to write a conclusion.

Statements	Conclusion
• Steel marbles will sink when placed in water. • Lana has a marble made of steel.	Lana's marble will sink when placed in water.
• Canadian citizens that are over 18 years of age can vote. • Carl is 22 years old.	
• Carl is a Canadian citizen.	
• The table is above the floor. • The plant is above the table.	
• The product of two numbers between 1 and 10 will be between 1 and 100. • m and n are numbers between 1 and 10.	
• If a triangle has a right angle, the other two angles are acute. • Triangle ABC is a right triangle.	

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