

Provides a fun way to practice counting, sorting, addition, subtraction, forming sets of 5s and 10s and rotation.



Highlights familiar and exotic South Pacific animals.



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Lesson Plan

Komodo Board Game

Background

Komodo was created by Amanda Milne and Julia Schiller of SchilMil Games of Auckland. The premise is that players are zoologists attempting to save South Pacific animals from an incoming asteroid by building a sanctuary composed of tiles bearing the kind of terrain the animals need.

As the directions to the game explain, there is a competitive base game; a variation for more experienced players in which wild cards are chosen instead of randomly received; and a cooperative version where players work to save all of the animals before the tiles run out. These games were intended for adults and children age 10 and up.

The activities in this Lesson Plan use the components of Komodo to help Level 1 and Level 2 students gain mastery of a number of mathematical skills related to number and algebra and geometry and measurement. Because the game includes Kiwi native animals as well as others that are apt to be unfamiliar to young children, Komodo is also relevant to the Science curriculum. There is a detailed list of specific curricular objectives related to use of Komodo in the classroom in Appendix A. Finally, since the activities involve working as a group, the key competency of relating to others is developed as well.

Specific mathematics skills students will learn/practice by using Komodo as a classroom resource:

- Counting
- Adding and subtracting to create or approximate units of 5, 10, 15, 20 and 25
- Relating shapes to quantities
- Sorting by appearance
- Rotating plane objects

Time Frame

It is anticipated that activities 1-3 could be completed in 50 minutes. Activity 3, which takes about 30 minutes, can be subsequently repeated on its own with the goal of preparing the students for activity 4, which should take at least 30 minutes.

Contents of Komodo Game

- 50 Terrain Tiles
- 32 Animal Cards (red backs)
- 32 Animal Markers with stands (assembly required)
- 20 Wild Cards (black backs)



Feedback

We would be grateful for feedback about your use of Komodo with your class. We are also happy to answer any questions you might have. Contact us at services@schilmilgames.com

Suggested Progression of Activities

Preparation

Ahead of the lesson(s), remove the terrain tiles, animal cards and animal markers from each Komodo game to be used (one game per group of four children). Find and set aside the starter tile (with blue border) as it will be presented to the children after the first activity. Ensure that tiles and cards have been randomized. Familiarise yourself with Komodo's tile and animal placement rules: pp 2-3 of the directions or watch our 90 second video: <http://youtu.be/IxB30PrS1c4>

1. Explanation/Introduction (to tailor for the particular class):

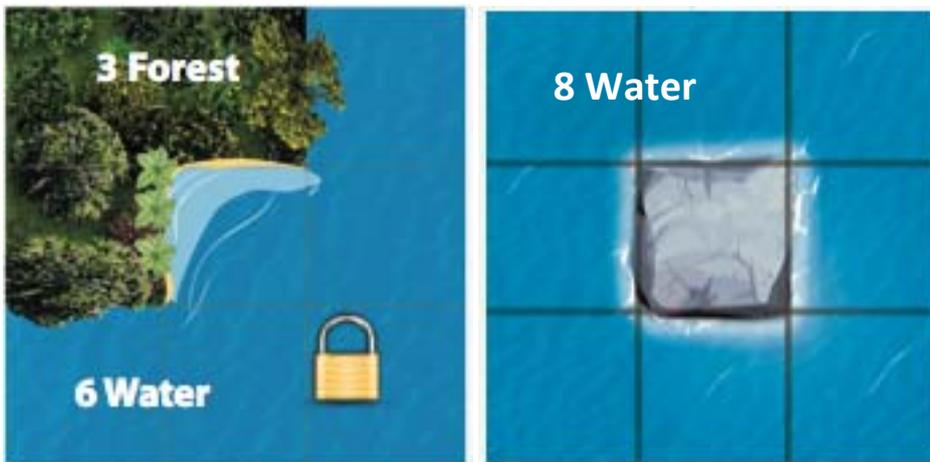
Whole class, sitting on floor with teacher

Groups of four students will be building a sanctuary for South Pacific animals using parts of the Komodo game.

- Check they know what South Pacific means and that New Zealand is included; ask which animals they might expect to encounter in the game.

The challenge is to be able to make an enclosure for every animal. There are multiple ways to achieve this goal, but it will be very important to use resources (tiles) as efficiently as possible. Each enclosure must be a separate *contiguous* (check/teach meaning) block of terrain (desert, grassland or forest) or water of a particular size. Terrain tiles contain 8 or 9 squares of one or a mixture of these terrains.

- Demonstrate how to count the squares of terrain using these or similar tiles as an example:



Most tiles in Komodo contain nine squares of land or water in a 3 x 3 grid, like the one at left. In addition, each terrain type has two tiles like the one at right. These count as 8 squares of the water or land—the rock doesn't count.

Check for understanding by showing some other tiles and asking students how many squares of a particular terrain there are. Also ask the other way round, i.e. there are four blocks of what kind of terrain on this tile?

2. Sorting and counting exercises

Sorting Tiles

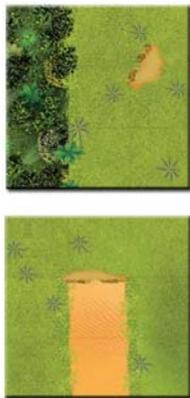
Students prepare for the activity. Groups of four students stand around a desk or desks put together so each group has approximately 800 x 500 cm² of space to work. Each group receives a set of terrain tiles.

Teacher explains that each group has received a number of the terrain tiles which should be counted and sorted so as each animal comes up later, the students can easily find the terrain it needs. Teacher suggests or allows students to come up with a method of sorting the tiles into piles.

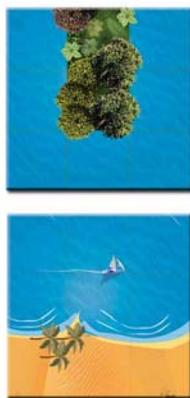
The optimum method is to make five piles, one each for tiles containing 5 or more squares of a particular terrain, and a fifth for tiles containing three types of terrain, with no type bigger than four squares.

Groups can divide their supply tiles into quarters so that each student can practice applying this method.

At the end, groups can check their results with each other. Using the optimum method, there should be 8 tiles in the desert pile, 11 in the forest pile, 9 in grassland, 10 in water and 11 tiles with three types of terrain, for a total of 49 tiles.



These two tiles should go in the grassland pile. They have 5+ squares of grassland.



These two tiles should go in the water pile. Top tile has 7 squares of water, bottom has 6.



These two tiles should go in the pile with tiles that have three kinds of terrain on them.

Sorting Markers

Now each group receives a set of 32 animal markers. Allow students to examine the markers and ask any questions that may arise. (Note: some of the animal names were abbreviated on the marker i.e. Thorny = Thorny Devil)

- How could these markers be sorted?

Possible answers:

- A. by type of animal
- B. by where the animal is from
- C. by terrain type it needs
- D. by amount of terrain it needs

Ask students to group markers by terrain type (water, forest, grassland or desert), then order them by number of squares needed. As they do this, they will note that with one exception (the weta), all of the 10-point animals have a matching 5-point animal.

When preparing students for the next activity, it is important to convey that these animal pairs are the same species, so it will be OK for them share an enclosure. Specifically, matching 5 and 10-point animals can be put in the same 10-square enclosure (not 15). This is an important way students can conserve terrain.

3. The basic challenge

(Entails use of counting, addition and subtraction, matching and spatial manipulation)

Demonstrate what the students will have to do, either with a teacher's copy of the game, using the illustrations in Appendix B or by showing the class the video : <http://youtu.be/IxB30PrS1c4> The goal is to join up tiles so that enclosures of the right number, type and size are created for all 32 animals (because there are eight species with a pair of animals that can share, a minimum of 24 enclosures will be needed.)

Distribute the starter tiles and animal cards to each group. Allow each group to decide if it will attempt to place the animals one by one or a few at a time. Circulate to provide assistance if needed. Students are free to move tiles into a better arrangement as they go.

Groups can race to see who completes the task first. Another way they can compete is to try to complete the task with the fewest tiles. There are many possible solutions.

Students can check each other's work when finished, insuring that each animal has an enclosure big enough or bigger than required. If one or some groups finish first, students can read the short paragraphs about the featured animals on page 7 of the directions.

4. Simplified cooperative game for 2-4 players

(Entails skills above plus planning sequences of events)

Once students have mastered the basic challenge, they can move toward playing the regular competitive or cooperative game. Playing without the wild card 'random threat' ratcheting device is a good way to simplify the cooperative game. Follow the directions below:

Work as a co-operative team to try to house all 32 animals. Each player must house at least one animal during their turn or the team loses and has to start again.

Shuffle the animal cards and mix the tiles facedown, then stack at one side of the play area. Give each player three animal cards and five terrain tiles. These should be displayed face up in the front of the player.

Players decide who should go first, considering how likely that player is to be able to house one of their animals and assist the following player to house theirs. Then play continues clockwise.

On their turn, players can place up to three tiles and house some or all of their animals. They can lay tiles with terrain subsequent players will need and/or they can plan ahead by starting to construct larger enclosures (such as 20 blocks of forest for the macaque) so players are ready when the large animals appear. Markers are a good reminder of which animals are yet to come. Remember that 5 and 10 point matching animals can fit in 10 squares of the terrain they need, an important way to get mileage out of the terrain tiles.

At the end of a player's turn, he or she should top up their tiles to five and animals to three. Towards the end of the game, players may not be able to fully replenish these, but should continue taking turns until all remaining animals are housed. When and if all 32 animals have been housed, the team wins. Or play to a time limit, for example, which group can house the most animals in 20 minutes? Or how many points has each group scored after 20 minutes?

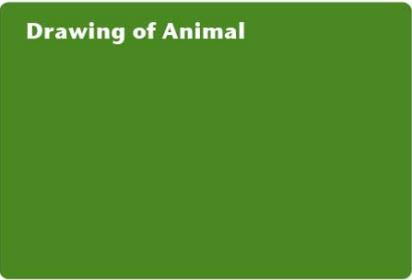
5. Regular competitive or cooperative game

Follow the directions on pp. 2-4 to have the students play competitively or on p. 6 for the regular cooperative game.

These games can take 45 minutes to one hour.

Follow Up Activity

Each student chooses and researches one of the animals featured in Komodo. Then they draw the animal, shade in its range on a map and write a few sentences about it for a sign that could go on the animal's enclosure at a sanctuary or zoo. The teacher may wish to provide the sign template, e.g.:

Drawing of Animal 	Name of Animal (3-4 sentences about the animal)	 Range of Animal
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Note: If tiles have become mixed together from multiple copies of Komodo, please visit the School Resources page of the Komodo website at www.komodogame.com for a tile set sheet you can download to check your games against.

Appendix A: Specific Objectives related to the Curriculum

New Zealand Curriculum: Mathematics and Statistics

Level One

Number strategies: Use a range of counting, grouping and equal-sharing strategies with whole numbers and fractions.

Number knowledge: Know groupings with five, within ten and with ten.

Equations and expressions: Communicate and explain counting, grouping, and equal-sharing strategies, using words, numbers and pictures.

Measurement: Order and compare objects or events by length, area, volume and capacity, weight (mass), turn (angle), temperature, and time by direction comparison and/or counting whole numbers of units.

Shape: Sort objects by their appearance

Position and orientation: Give and follow instructions for movement that involve distances, directions and half or quarter turns.

Transformation: Communicate and record the results of translations, reflections, and rotations on plane shapes.

New Zealand Curriculum: Science

Level One

Life processes: Understand the processes of life and appreciate the diversity of living things.

Level Two

Number strategies: Use simple additive strategies with whole numbers and fractions.

Number knowledge: Know the basic addition and subtraction facts.

Equations and expressions: Communicate and interpret simple additive strategies, using words, diagrams (pictures), and symbols.

Patterns and relationships: Generalise that whole numbers can be partitioned in many ways.

Measurement: Partition and/or combine like measures and communicate them, using numbers and units.

Shape: Sort objects by their spatial features, with justification.

Transformation: Predict and communicate the results of translations, reflections, and rotations on plane shapes.

Level Two

Life processes: Recognise that all living things have certain requirements so they can stay alive.

Ecology: Recognise that living things are suited to their particular habitat.

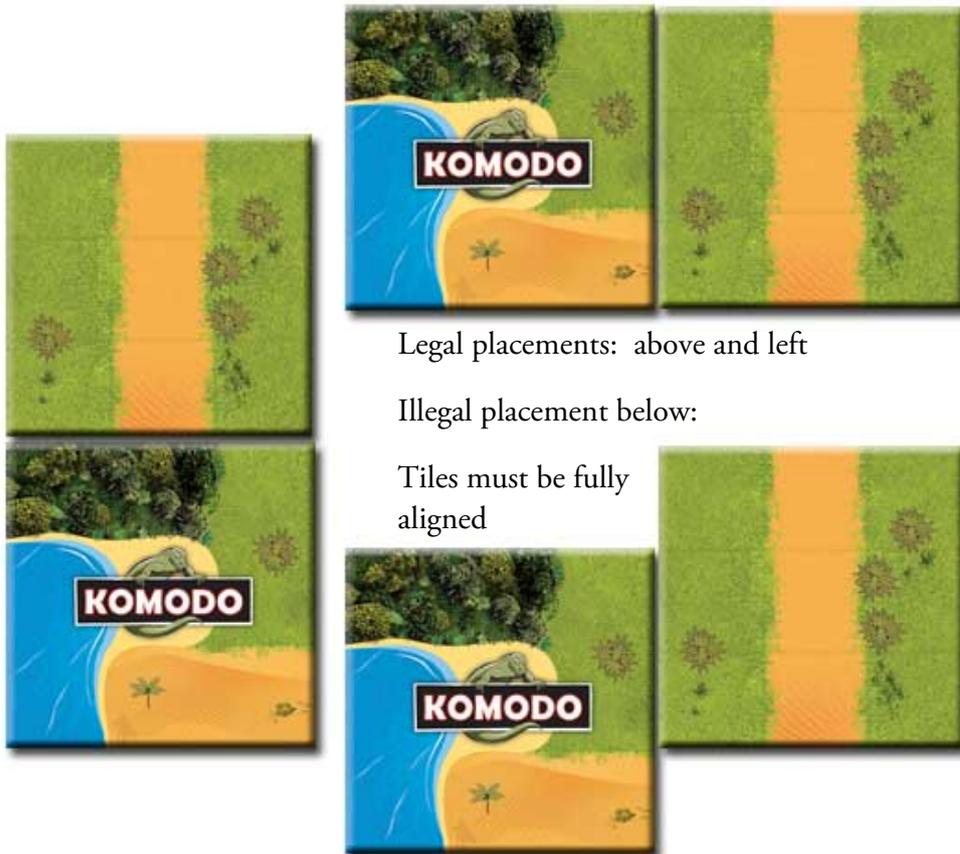
Evolution: Recognise that there are lots of different living things in the world and that they can be grouped in different ways.

Appendix B: Placement Rules for Tiles and Animals

1. The starter tile

Begin by building off the starter tile, which contains two squares of water, two squares of desert, two of forest and two of grassland.

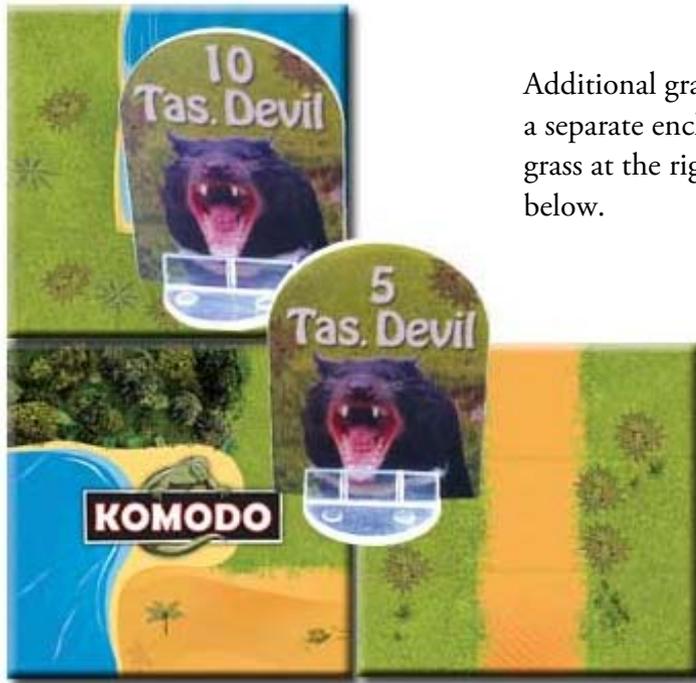
2. Place a second tile adjacent to the starter tile, matching at least one square from each tile along the aligned edges:



3. When enough land or water has been arranged to fit an animal, place its marker on the board to indicate that that block is occupied.



4. Terrain tiles must not be placed so as to merge two animal enclosures together unless the animals are the same species.
5. Five and ten-point pairs can share ten (or more) squares of their required terrain:



Additional grassland animals must be placed in a separate enclosure. The unoccupied strip of grass at the right could be added to as in #6 below.

6. Here a koala has been placed too. The numbers on cards and markers also indicate points that can be scored if playing competitively.

