

## Marsupials

In Australia I can see 10 eyes and 3 tails. How many marsupials can I find?

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# Exemplars

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## Marsupials

### Suggested Grade Span

Pre-K-2

### Task

In Australia I can see 10 eyes and 3 tails. How many marsupials can I find?

### Alternate Versions of Task

#### More Accessible Version:

In Australia I can see 6 eyes. How many marsupials can I find?

#### More Challenging Version:

I went to Australia and saw many marsupials.  
I saw twice as many kangaroos as I saw koalas.  
I saw 5 more sugar gliders than koalas.  
I saw the same number of wombats as sugar gliders.  
I saw 10 wombats.

How many marsupial eyes and tails did I see?

### Context

The students in our multi-age first and second grade classrooms have been very interested in the unique wildlife of Australia. We decided to combine our study of marsupials with the mathematical concept of pairs and counting by twos.

### What This Task Accomplishes

This problem encourages children to identify and sort attributes of marsupials and non-marsupials (animals with or without pouches, tails or no tails) and counting pairs of eyes. Observing how children approach the solution shows their understanding of number sense and attributes, as well as their understanding of social studies/science content.

### What the Student Will Do

In solving this problem, students were encouraged to use projects they had created or posters of marsupials, as well as classroom books and magazines. Many used centimeter cubes to

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represent pairs of eyes and tails. Other manipulatives were also used for this same purpose. The students were asked to illustrate their solutions, then write independently or dictate to an adult.

## Time Required for Task

45 - 60 minutes

## Interdisciplinary Links

This task obviously lends itself well to the study of marsupials and the study of wildlife on the continent of Australia. During our study of Australia, students have investigated animal habitats and read a variety of literature such as *Koala Lou*, written by Mem Fox and Pamela Lofts (Illustrator) and *Magic Possum*, written by Mem Fox and Julie Vivas (Illustrator). Kangaroos are also a favorite for movement, estimating distance for hops and predicting how much you can fit into a pocket.

## Teaching Tips

Students this age need a lot of hands-on practice with pairs. We had practiced on their shoes, eye color, dice, hands, wooden cubes and other objects before students approached this task. As mentioned earlier, it is also important to have visual materials in the classroom available to which students can refer, such as books, posters, etc. The students also spent several weeks becoming familiar with the attributes of marsupials and other wildlife in Australia before attempting this task.

## Suggested Materials

- Pictures of marsupials
- Manipulatives which can represent pairs, tails, etc.

## Possible Solutions

There are a variety of combinations that students can use to arrive at the solution of five marsupials of which three must have tails. The chart below illustrates possible selections of marsupial combinations that provide a solution.

Marsupial	Tail	No Tail
Kangaroo	x	
Koala		x
Sugar Glider	x	
Ring-Tailed Possum	x	
Wombat		x
Bandicoot	x	
Numbat	x	

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## More Accessible Version Solution:

$$6 \text{ eyes} \div 2 = 3 \text{ marsupials}$$

## More Challenging Version Solution:

Marsupial	Tail	No Tail
Kangaroo	x	
Koala		x
Sugar Glider	x	
Ring-Tailed Possum	x	
Wombat		x
Bandicot	x	
Numbat	x	

Wombats = 20 eyes and 0 tails

Sugar Gliders = 20 eyes and 10 tails

Sugar Gliders (10) – 5 = 5 Koalas = 10 eyes and 0 tails

2 x 5 koalas = 10 kangaroos = 20 eyes and 10 tails

Total eyes = 70

Total tails = 20

## Task Specific Assessment Notes

### Novice

This student started a strategy, but did not use the information provided or mathematical reasoning to help solve this problem. The illustration shows the marsupials, but uses very limited or no mathematical notation for eyes and tails.

### Apprentice

This student started a strategy that was partially useful, but did not arrive at a full solution. Some mathematical notations are shown for the eyes, but tails are incorrect. The student was not able to clearly explain his/her drawings.

### Practitioner

This student demonstrates a broader understanding of the task. It is interesting how the illustrations represent the pouch attribute, which is important for marsupials. The student was also able to keep accurate track of eyes and tails. The student clearly has an understanding of pairs.

### Expert

This solution demonstrates effective strategies that lead to a solution. There are clear and effective explanations to match his/her illustrations with mathematical and scientific attributes.

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This student also has mastered the concept of pairs.