

Name:

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Activity 2 – Tiger Trials (Upper KS2)

Many animals are threatened by the destruction of their habitat. When their homes are destroyed, there is less space for them to find food, water and mates and the animal species starts to die out. Conservationists work to stop this from happening.

Part 1: Paws and Parks

There are 3,981 tigers left in the world. It is your job as a conservationist to move the tigers into new protected wildlife parks to stop them from going extinct. You can buy land to make new parks.



Each wildlife park needs a population of at least 514 tigers.

Buying a higher number of parks means that you can protect a larger area and so protect lots of other animals too.

How many parks should you buy?

Use short division to work out your answer. Have a think about how to approach this question and if you are stuck, see Fezziwig's Tiger Trial Tips on the next page to help you!

Check your answers to each part as you go, so you can move on to the next part.

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Fezziwig's Tiger Trial Tips for Part 1:

A tricky one to get your head around! How should you go about this? What are you trying to do?

We want to buy as many parks as possible to protect the largest area. But we can't buy *too* many, otherwise there won't be enough tigers in each. You want to be *systematic* in the way you solve it, which means that you want to have a system or a plan for trying different options. Try each number of parks one at a time, increasing as you go. How many tigers are in each park if you buy 3 parks?

Find out by dividing the number of tigers by 3, to see how many tigers would be in each park if they were shared between them. Then try 4, 5, 6 parks and so on. What is the highest number of parks that can be found, with each park still having over 514 tigers?

Once you have an answer that is less than 514 tigers, you have bought too many parks!

This is a real-life problem conservationists face. They have to work out how many areas they can buy and protect for wildlife without making the populations in each park too small! It's not easy, but when they get it right, they can help save a species from extinction!

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Part 2: Tigers and Transport

1,454 of the tigers are already within one of the parks. *The rest* need to be moved. The tigers can be moved by plane or by truck. A small plane can carry nine tigers, whilst a truck can carry three tigers.

How many flights would be needed to move all of these tigers?

How many truck journeys?



Part 3: Cats and Cash

You have a limited amount of money to spend on transport. These are the costs of each approach.

Transport	Cost
Flight	£72
Truck journey	£25

Which is the cheapest way to transport the tigers from Part 2?

For both parts, you may need to multiply, subtract or add, as well as divide, to find out the answers. Have a think about how to approach these questions and if you are stuck, see Fezziwig's Tiger Trial Tips on the next pages to help you!

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Fezziwig's Tiger Trial Tips for Part 2 and Part 3:

Part 2:

It's important to read the question here: how many tigers need to be transported to their parks? It's not 1,454, that's how many have *already been* placed in a park. How can you find out how many are left to move? You need to subtract 1,454 from the total number of tigers in Part 1. Now you know how many tigers need moving, what is your next step?

You need to work out how many flights you need. This is where division comes in! Each plane can hold nine 9, so you need to divide the number of tigers by 9. Then the same for trucks. Make sure you are dividing the tigers by the right number here: how many tigers can a truck hold?

Key tip: Remember, if you get a remainder in your division then that means your tigers don't exactly fit into the planes or trucks. Those last few tigers still need to be transported, so you should add one extra flight or truck journey e.g. an answer of 362 r 5 flights means you really need 363 flights to transport all the tigers. You can't leave some tigers behind!

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Part 3:

This question is different. Which operation are you using here (+, -, x or ÷)? You need to multiply the number of flights and truck journeys from Part 2 by the cost. This is multiplication of large numbers. Use a method you are comfortable with to work these out. Then compare your answers. Which method is cheaper, planes or trucks? Is one cost *less than* the other (remember the symbol for less than is <)?

Extension to get your teeth into!

Did you like seeing how maths is used in real life conservation? Conservationists use maths to help them work out how best to protect animal and plant species around the world. The number 3,981 *was* the real number of tigers in the world a few years ago, but this is certainly not the case anymore. Why not look up the real number of tigers today? How has it changed? Has it increased or decreased? Do you think this is due to conservation issues such as poaching or conservation efforts to protect them? How would you protect tigers?

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Tiger Trials Answers

Part 1:

7 parks is the highest number of parks that can be bought with more than 514 in each park. Short divisions for 2, 3, 4, 5, 6, and 7 parks all result in parks with more than 514 tigers in. 8 parks and beyond have less than 514 tigers in them. Therefore 7 is the greatest possible number of tigers.

$$2 \overline{) 3981} \quad \begin{array}{l} 1990.5 \text{ tigers per park} \\ \text{(or } 1990 \text{ r } 1) \end{array}$$

$$3 \overline{) 3981} \quad \begin{array}{l} 1327 \text{ tigers per park} \end{array}$$

$$4 \overline{) 3981} \quad \begin{array}{l} 0995.25 \text{ tigers per park} \\ \text{(or } 995 \text{ r } 1) \end{array}$$

$$5 \overline{) 3981} \quad \begin{array}{l} 0796.2 \text{ tigers per park} \\ \text{(or } 796 \text{ r } 1) \end{array}$$

$$6 \overline{) 3981} \quad \begin{array}{l} 0663.5 \text{ tigers per park} \\ \text{(or } 663 \text{ r } 3) \end{array}$$

$$7 \overline{) 3981} \quad \begin{array}{l} 0568 \text{ r } 5 \text{ tigers per park} \end{array}$$

$$8 \overline{) 3981} \quad \begin{array}{l} 0497 \text{ r } 5 \text{ tigers per park} \end{array}$$

($5 \div 8 = 0.625$, so could be 497.6 tigers but in this case a remainder is simpler)

$$9 \overline{) 3981} \quad \begin{array}{l} 0442 \text{ r } 3 \text{ tigers per park} \end{array}$$

($3 \div 9 = 0.333333$, so could be 497.3 tigers or $497 \frac{1}{3}$ tigers but in this case a remainder is simpler)

($5 \div 7 = 0.714$, so could be 568.7 tigers but in this case a remainder is simpler)

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Part 2:

281 plane flights are needed, 843 truck journeys are needed.

$3981 - 1454 = 2527$ 2527 tigers need to be transported.

$$9 \overline{) 2527} \begin{array}{r} 0280r7 \\ \underline{2527} \\ 0 \end{array} = 281 \text{ flights}$$

$$3 \overline{) 2527} \begin{array}{r} 0842r1 \\ \underline{2527} \\ 0 \end{array} = 843 \text{ truck journeys}$$

In each case, there is a remainder number of tigers, so one extra plane flight and one extra truck is needed to move all the tigers.

Part 3:

The price for all flights: $281 \times 72 = \text{£}20232$, price for all truck journeys: $843 \times 25 = \text{£}21050$
 $\text{£}20232 < \text{£}21050$ ($\text{£}20232$ is less than $\text{£}21050$) therefore flights are cheaper.

(This makes sense: transporting most of the tigers by flight is likely to be the cheapest option. 9 tigers can be transported for £72 by plane, but by truck nine tigers would take three trucks (£25 each). As $\text{£}72 < \text{£}75$, it is always cheaper to transport 9 tigers by plane rather than truck.)

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Advice for Parents

Short division sends shivers down many a parent's spine when their child brings it home as homework, but it need not make you concerned! It's a simple procedure and worked examples of the method can be found on YouTube and in the appendix of the national curriculum, which is linked on our home education resources page (this should also be true for the long multiplication in Part 3). We can upload worked examples of how to answer the short divisions in Part 1, if this is an area of concern (please message us on Facebook for this). The given answers in this document allow that remainders being converted into decimals may not have been covered in school yet.

This is designed to be a low-floor, high-ceiling activity: children can get as much out of it as they like. If their interest in conservation is low, then completing Part 1 will be a solid practice of the principles of short division in the context of a word problem. If interest or confidence is high, then Parts 2 and 3 help them to integrate division into the wider context of using different operations in multi-step problems. The extension can then be used to reframe the maths back into the context of conservation.

Word problems are a tricky part of maths but can often help enthuse and engage. Children should focus on extracting the important information from the question: what information is it giving me? What answer/result am I aiming for? What operation (+, -, x or \div) do I need to use to get there? The 'tips' help talk children through this process. Children who are confident in maths can and should be stretched and challenged by asking them to explain their working out loud or in written sentences.