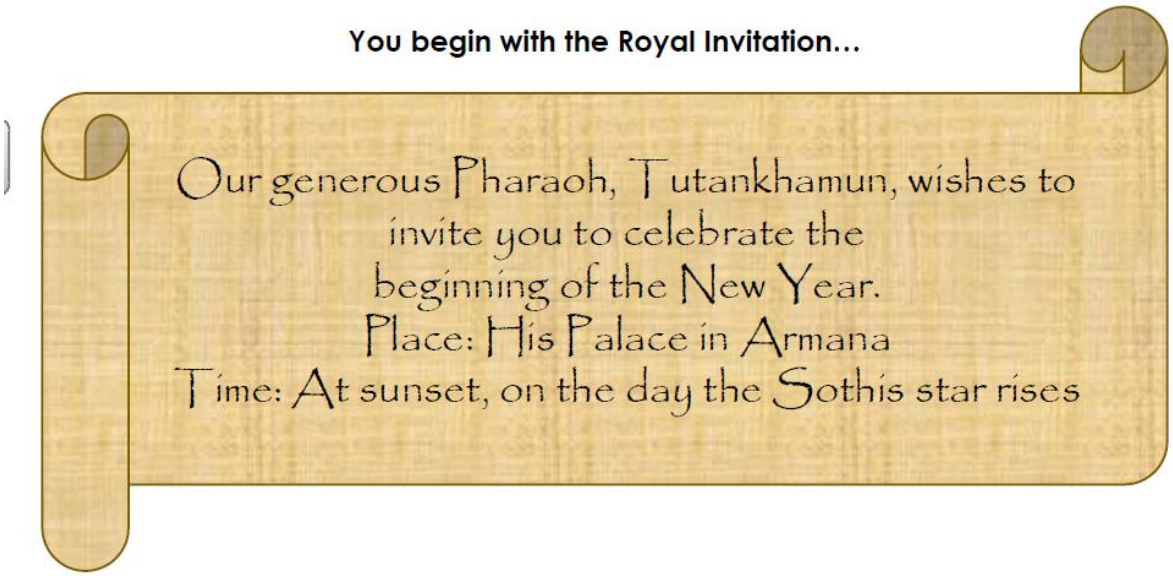
Reasoning and problem solving investigation

The young Egyptian Pharaoh, Tutankhamun, has informed you that he would like a great feast to celebrate the beginning of the New Year.
You have been given the task of making all the arrangements.

You begin with the Royal Invitation…

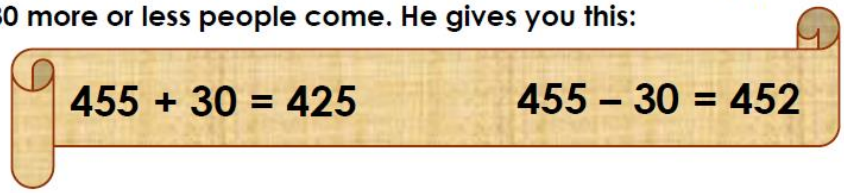


1. There are currently 141 letters to write per invitation. Use this table to help you work out how many letters there would be if you changed the wording of the invitations. Check your answers using an inverse operation. The first calculations have been written in for you to work out.

Add the word:	Calculation	Inverse Operation Check
most	141 + 4 =	
grand		
welcome		

Remove the word:	Calculation	Inverse Operation Check
in	141 – 2 =	
generous		
celebrate		

Next, you must decide how much food to organise.
There are 455 confirmed guests attending the feast. The palace cook suggests making 455 pieces of bread shaped into fish. You are concerned he might make too much bread or perhaps not enough. You ask him to calculate how many pieces of bread he will need if 30 more or less people come. He gives you this:



You realise his calculations are all wrong!

2. Work out the correct calculations. Explain his mistakes so you can show him later.

455 + 30 = 425	455 – 30 = 452

Now you need to sort out the drinks.
You start with 365 litres of the Pharaoh's favourite drink. Your team in charge of the drinks don't think that is enough, so they order some more. Unfortunately, the ink spills on their order so you don't know how much more they ordered. You do know it's a multiple of 100 and the total amount is less than 1000 litres.

3. How many litres of drink could they have ordered in total?
Write all the possible answers.

4. Next, you need to sort the decorations. Tutankhamun loves gold and has requested his palace be decorated to match. He would like exactly 200 ornate rugs and couches be in each room that will be open for the party. How many more of each item should be ordered for each room?

Rugs	
Already have:	To make 200:
Room 1: 190	
Room 2: 150	
Room 3: 130	
Room 4: 160	

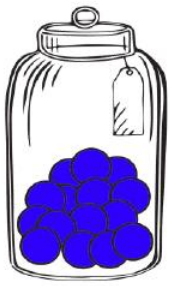
Couches	
Already have:	To make 200:
Room 1: 110	
Room 2: 180	
Room 3: 120	
Room 4: 140	

5. He would also like each room to have exactly 200 lamps and 400 candles. How many new lamps and candles should be ordered for each room?

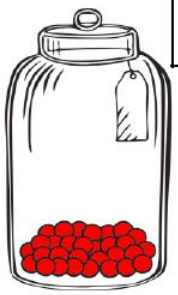
Lamps	
Already have:	To make 200:
Room 1: 191	
Room 2: 196	
Room 3: 193	
Room 4: 192	

Candles	
Already have:	To make 400:
Room 1: 397	
Room 2: 395	
Room 3: 394	
Room 4: 398	

6. The Pharaoh loves party games. This is his favourite, but he gets very upset when he loses! He demands a practise round at guessing the number of jewels in each jar. To help him, you hint that the total number of jewels is 150.
What would be a reasonable estimation for him to make?



Sapphires



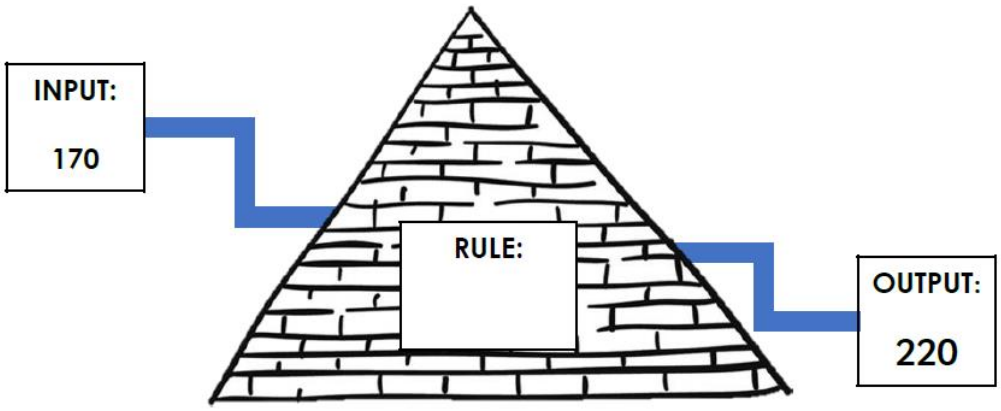
Rubies

Emeralds

The Pharaoh would also like to play musical chairs with all his guests. However, not all the chairs are suitable for the game as some of them are quite delicate and rather expensive.

7. If the palace has 510 chairs in total, and 70 of them are unsuitable, how many chairs can be used for the game? Will there be enough for all the guests to play?

Your assistant, Amasis, decides you could do with some help with all these calculations. He designs this function machine to help you work out calculations for if fewer guests come than expected.



8. He says the rule for this function machine is subtract 50.
Do you agree? Explain your answer.

Finally, it is the day the Sothis star arises. After all your careful planning, the sun begins to set and the Pharaoh's guests arrive. He is very pleased with you for making sure the feast is a success. Whilst people are enjoying themselves you are making sure everything is going well.

9. You count 485 guests at the feast.
227 guests are females.
How many males are at the feast?
Work out your answer in the box.
Show how to check your answer.

Answer:	Check:

10. When rounded to the nearest 10, there are 220 children at the feast.
How many adults could there be at the feast? List three possibilities.

Well done, your royal duties are over for today!
The Pharaoh is very pleased with your efforts!

Answers

1.

Add the word:	Calculation	Inverse Operation Check
most	141 + 4 = 145	145 – 4 = 141
grand	141 + 5 = 146	146 – 5 = 141
welcome	141 + 7 = 148	148 – 7 = 141

Remove the word:	Calculation	Inverse Operation Check
in	141 – 2 = 139	139 + 2 = 141
generous	141 – 8 = 133	133 + 8 =141
celebrate	141 – 9 = 132	132 + 9 = 141

2. 455 + 30 = 485; he has subtracted 30 instead of adding 30
   455 – 30 = 425; he has subtracted 3 ones instead of 3 tens
3. 365 + 100 = 465 365 + 400 = 765
   365 + 200 = 565 365 + 500 = 865
   365 + 300 = 665 365 + 600 = 965
4.

Rugs	
Already have:	To make 200:
Room 1: 190	10
Room 2: 150	50
Room 3: 130	70
Room 4: 160	40

Couches	
Already have:	To make 200:
Room 1: 110	90
Room 2: 180	20
Room 3: 120	80
Room 4: 140	60

5.

Lamps	
Already have:	To make 200:
Room 1: 191	9
Room 2: 196	4
Room 3: 193	7
Room 4: 192	8

Candles	
Already have:	To make 400:
Room 1: 397	3
Room 2: 395	5
Room 3: 394	6
Room 4: 398	2

6. Answers will vary but should match up with the increasing quantities depicted in the picture: for example, 10 Sapphires, 40 Rubies and 100 Emeralds.
7. 510 – 70 = 440 chairs can be used to play the game. There are 455 confirmed guests, so he needs another 15 chairs for everyone to be able to play.
8. No. The rule is add 50 not subtract 50.

9.

Answer:	Check:
4 8 5 - 2 2 7 2 5 8 females	2 5 8 + 2 2 7 4 8 5

10. There could have been between 215 and 224 children, so:
485 – 224 = 261 and 485 – 215 = 270
There could have been between 261 and 270 adults.