MATH DETECTIVES
CRIME SCENE INVESTIGATION

Last night in the peaceful town of Chill-Ville a horrible crime took place. Someone broke into the bank, shot the security guard and stole one million dollars.

One of the eight suspects below committed the crime but the police need your help to find out who.

THE SUSPECTS

SUSPECT 1	SUSPECT 2	SUSPECT 3	SUSPECT 4
SUSPECT 5	SUSPECT 6	SUSPECT 7	SUSPECT 8

THE POLICE HAVE FOUND 4 CLUES.

AFTER YOU HAVE SOLVED EACH CLUE COME BACK HERE TO CROSS PEOPLE OFF THE SUSPECT LIST UNTIL YOU HAVE FOUND THE CRIMINAL

CLUE 1: HIDDEN MESSAGE

IT APPEARS THE SUSPECT LOVES MATH RIDDLES AND HAS LEFT A MATHS CLUE AT THE SCENE OF THE CRIME. THE POLICE HAVE FOUND THE FOLLOWING SET OF MATH CLUES AND NEED YOUR HELP TO CRACK IT TO FIND THE MESSAGE

Solve the problems, then fill in the message spaces with the letters that match the correct answers to read the secret message. This will let you cross off two people from the suspect list.

A 5X6	B 5X5	C 4X6	E 9X10	F 7X8
H 2X9	I 6X6	M 1X6	N 4X4	X4
P 2X7	R 7X7	S 4X5	3X	U 4X3
W 9X5	X	Y 9X8		

__ __ __ __ __ __ __
36   6   36 16   21 18 90

__ __ __ __ __ __ __ __ __ __
20 32 20 14 90 24 21   6 36 35

__ __ __ __ __ __ __ __ __
25 32 21   36   30 6   16 12 21

__ __ __ __ __ __ __ __ __ __ __.
16 32 6 25 90 49   20 36 35   36 56

__ __ __ __ __ __ __ __ __
45 18 30 21   36   20 30 72   36 20

__ __ __ __ __ __ __ __ __ __ __
21 49 32 90   21 18 30 16   36   30 6

__ __ __ __ __ __ __ __ __ __ __
16 12 21   20 32 20 14 90 24 21   21 45 12

Path of the Criminal

By using a tracking dog the police were able to find the path the criminal took after he stole the money.

Eyewitness reports have come in showing where all the suspects were seen after the crime. If they were seen along the path the police dog tracked then they could be the criminal.

SUSPECT	Where they were seen	Path of the track? Y or N
Suspect 1	Park	
Suspect 2	Waterslide	
Suspect 3	Carpark	
Suspect 4	School	
Suspect 5	Factory	
Suspect 6	Movies	
Suspect 7	Church	
Suspect 8	Grocery Store	

Draw the path the criminal took
Start at **point X** near the bank.

Important! - Use a ruler to measure
1cm on the paper = 100m in real distance.

Criminal walked 5x100m East

Then 170m+130m North

Then 280+70m West

Then 300x2 m North

Then 800-200m West

Then 550m South. The criminal then got in a car.

Take the suspects who were not somewhere on the path of the track off the suspect list.

CLUE 2: MAP OF TOWN CHILL-VILLE

SCALE: 1CM = 100M

CLUE 3: TIME FOR CRIME

The crime was commiteed at lunchtime. The criminal needed a 40min time slot to complete the crime. You are told the times the suspects left for lunch and the times they arrived back. Any suspect who spent less than 40mins at lunch can be taken off the suspect list

Suspect One left at 12:15pm and arrived back at 12:35pm   Time at lunch: _____

Suspect Two left at 12:25pm and arrived back at 1:25pm   Time at lunch: _____

Suspect Three left at 12:05pm and arrived back at 1_:_5pm   Time at lunch: _____

Suspect Four left at 1:00pm and arrived back at 1_:50p_   Time at lunch: _____

Suspect Five left at 12:15pm and arrived back at _:35p_   Time at lunch: _____
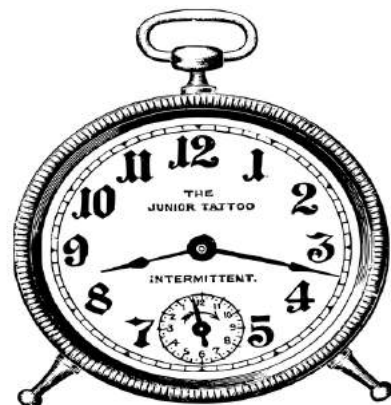
Suspect Six left at 1:15pm and arrived back at 2:00pm   Time at lunch: _____

Suspect Seven left at _:_0p_ and arrived back at 12:30pm   Time at lunch: _____

Suspect Eight left at 1:45pm and arrived back at 2:35pm   Time at lunch: _____

Which **suspects** spent less than 40mins at lunch and could not have committed the crime?

CLUE 4: CHEMICAL TRACES

Some of the notes that the criminal stole were marked with a chemical that the police use to track money.

The police retrieved money from all of the suspects homes. Small parts of the chemical were found on all of the notes, however the suspect which has the least amount of chemical on their notes can be safley removed from the suspect list

Amount of chemical on notes

Suspect 1:   0.002 + 0.004   = _____

Suspect 2:   0.093 + 0.007   = _____

Suspect 3:   0.12 + 0.33   = _____

Suspect 4:   0.98 - 0.32   = _____

Suspect 5:   3.3 - 2.3   = _____

Suspect 6:   0.01 + 0.008   = _____

Suspect 7:   0.9 - 0.2   = _____

Suspect 8:   0.003 + 0.002   = _____

SUSPECT WITH LEAST AMOUNT OF CHEMICAL ON THEIR NOTES: _____

TAKE THIS PERSON OFF YOUR SUSPECT LIST, THEY DIDN'T DO IT

REWARD

THANKYOU FOR YOUR HELP YOU IN CATCHING THE CRIMINAL.

As a reward for your efforts the police team has awarded you a medal for bravery. They have also given you $10,000 to spend and have arranged for you to have a day out where they will take you anywhere and let you do anything you want.

What are you going to do and see on your day out?

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

What are you going to spend your $10,000 on?

_____

_____

_____

_____

_____

_____

_____

_____

_____

Draw your medal here

IN-COMING MESSAGE

Just when you thought it was all over.....
You hear a beeping coming from the back of you car. What is that noise? There is an old morse code machine in the back of your car. The army used to use these machines to send secret messages to each other. Use the table below to help you decode the message.

A	•—	B	—•••	C	—•—•	D	—••	E	•
F	••—•	G	——•	H	••••	I	••	J	•———
K	—•—	L	•—••	M	——	N	—•	O	———
P	•——•	Q	——•—	R	•—•	S	•••	T	—
U	••—	V	•••—	W	•——	X	—••—	Y	—•——
Z	——••								

Write your own morse code message below:

TEACHER NOTES – A4

Firstly, a big THANK YOU for purchasing this product. Please checkout my store for more products and follow me for updates.

These CSI projects are a great way to capture your students interest in math.

Activity Focus: Measurement, calculating area of rectangles, calculating area of irregular shapes, calculating volume, cardinal directions, and time scheduling.

IMPORTANT NOTES

Before printing please check what pages you need – for the clues titled hidden message and tracking the criminal there are two options– just give your students one.

Hidden message: The rectangles are to scale so I have provided two options, one with the length and width written next to each triangle and one where the students have to measure using a ruler to find the width and length. If you choose the measurement option please note this has to be done in cm – not inches.

Tracking the criminal: This activity requires the students to measure so you will need to ensure your students have access to a ruler. I have provided two sets of instructions, one using cm and one using inches. Please select the one you need for printing.

– PLEASE CHECK YOU ARE PRINTING THE FILE WITH THE CORRECT PAGE SIZES (EITHER A4 OR US LETTER – FOR USA) – THIS IS THE A4 SIZE DOCUMENT.

Possible Standards (USA)

CCSS.MATH.CONTENT.6.G.A.1
Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.

CCSS.MATH.CONTENT.6.G.A.2
Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = l\,w\,h$ and $V = b\,h$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.

CCSS.MATH.CONTENT.7.G.A.1
Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.
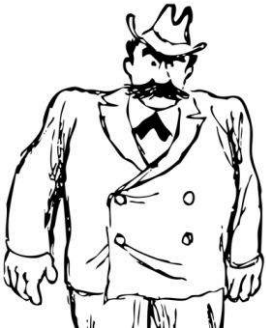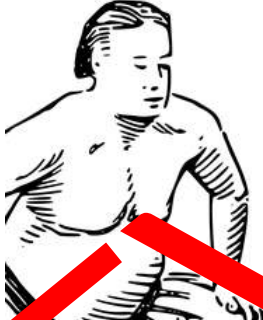
CCSS.MATH.CONTENT.7.G.B.6
Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

CRIME SCENE INVESTIGATION

Yesterday the bank was robbed. An armed offender wearing a mask entered the bank, blew a hole in the bank safe, stole $1 million and then fled on foot.

The most likely suspects were gathered up and are shown below, one of these suspects committed the crime. Use the evidence on the following pages to find out which one.

HAPPY HARRY	GRUFF GRIFF	HEROINE HILDA	MUSICAL MOLLY
PAPERBOY PAUL	SUMO SAM	TINKERBELL TINA	RICH RUPERT

THE POLICE HAVE FOUND FIVE CLUES WHICH CAN BE SEEN ON THE FOLLOWING PAGES

AFTER YOU HAVE SOLVED EACH CLUE COME BACK HERE TO CROSS PEOPLE OFF THE SUSPECT LIST UNTIL YOU HAVE FOUND THE CRIMINAL

HIDDEN MESSAGE

The criminal left behind a hidden message at the crime scene and the police need your help to crack the code. **Calculate the area of each of the shapes below. Match the answers up to a letter using the table at the bottom (e.g. A=1). Fill in the missing spaces in the message at the bottom using the answers from the questions.**

To work out area multiply width x length.

Q1/

5

4

Area = WxL
Area = 4x5
Area =

Q2/

4

2

Area = WxL
Area = 4x2
Area =

Q3/

1

5

Area = WxL
Area =

Q4/

7

2

Area =

Q5/

3

5

Area =

Q6/

4

5

Area =

Q7/

2

4

Q8/

3

3

Q9

4

3

Q10/

2

2

Q11/

1

1
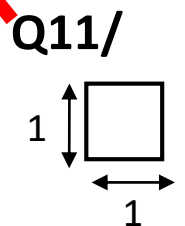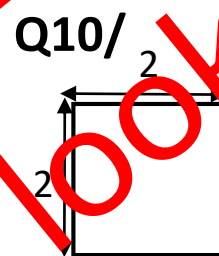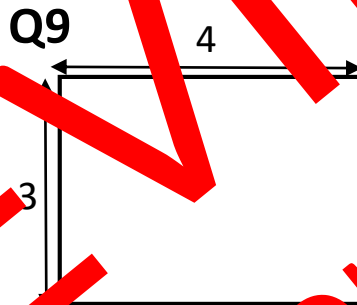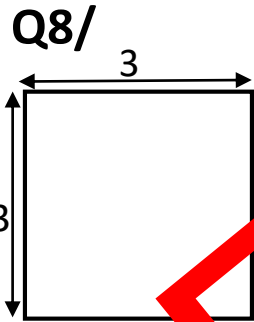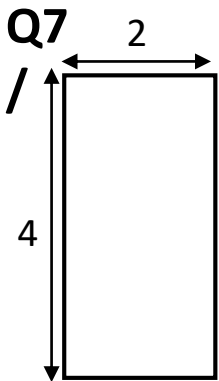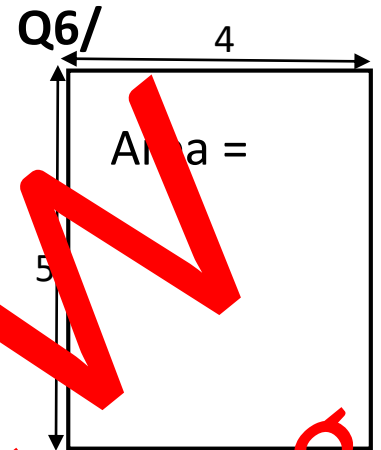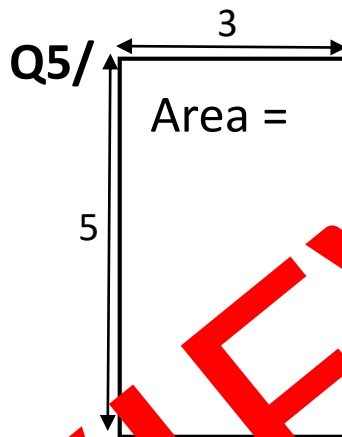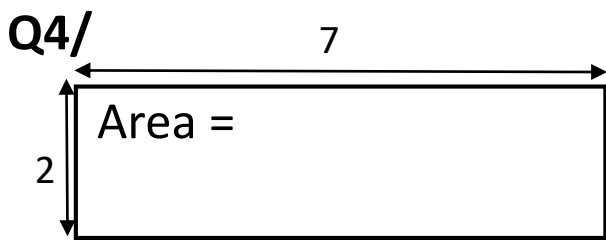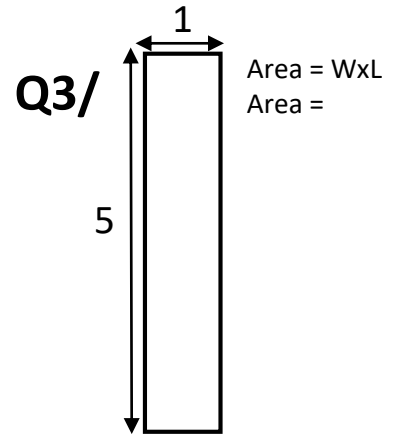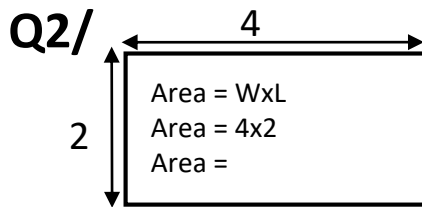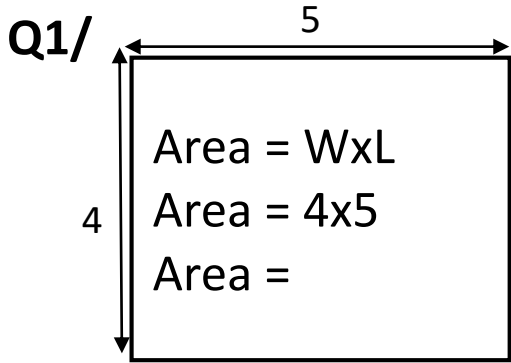
Use the answers to the questions and the table below to complete the message at the bottom.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26

CRIME WAS _____ COMMITTED BY

| Answer Q1 | Answer Q2 | Answer Q3 | | Answer Q4 | Answer Q5 | Answer Q6 |

| Answer Q7 | Answer Q8 | Answer Q9 | Answer Q10 | Answer Q11 |

STORING THE MONEY

Police have found out that after the money was stolen it was hidden in the criminals attic before then being moved away. The money would of taken up a lot of space. All the suspects attics were measured and the two suspects with the smallest attics can be crossed off the suspect list as they wouldn't of had enough room to hide the money.

Which two suspects have the smallest total floor area in their attic?
(Cross these suspects off your suspect list – they didn't do it)

Hint: To calculate area you can either **count the number of squares** in each attic **OR** break the area up into parts and multiple length x width for each part

e.g. has an area of 6 squares
3 x 2 = 6
(length) x (width)

Harrys Attic Amount of squares (area): _____	Griffs Attic Amount of squares (area): _____	Hildas Attic Area:	Mollys Attic Area: _____
Pauls Attic Area: _____	Sam's Attic Area: _____	Tinas Attic Area: _____	Ruperts Attic Area: _____

CROSS THE TWO SUSPECTS WITH THE TWO SMALLEST ATTICS OFF YOUR SUSPECT LIST

BREAKING INTO THE SAFE

The safe to the bank was blown open using gunpowder from fireworks. All the suspects were found to have empty firework boxes in their houses, however it would of taken a large amount fireworks to get the amount of gunpowder needed to blow open the safe.

Calculate the volume of each suspects fireworks box and cross the suspect who has the fireworks box with the smallest volume off the suspect list.
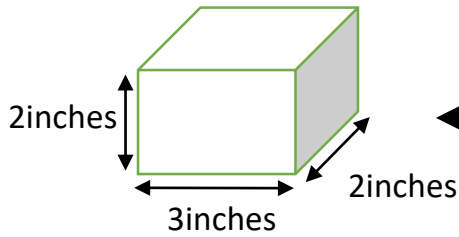
To Calculate Volume = height x width x length
e.g. 2inches x 3inches x 2inches
= 12inches^3

CROSS THE ONE SUSPECT WHO HAS THE BOX WITH THE SMALLEST VOLUME OFF THE SUSPECT LIST.

Happy Harry	Gruff Griff	Heroine Hilda	Musical Molly
Volume= height x width x length Volume = 4 x 5 x 2 Volume =	Volume= height x width x length Volume = 6 x 3 x 2 Volume =	Volume =	Volume =

Paperboy Paul	Sumo Sam	Tinkerbell Tina	Rich Rupert
Volume =	Volume =	Volume =	Volume =

TRACKING THE CRIMINAL – Centimetres

After the crime the criminal escaped from the bank and their path was tracked using a sniffer dog. Some witness reported seeing suspects in different parts of the city after the crime.

Track the path of the criminal using the table on the side. Any suspect who was NOT seen along the path of the criminal can be crossed off the suspect list. Hint – stay on the roads.

PATH OF CRIMINAL

SCALE

1cm = 10m

From Bank Criminal went

10 metres east,
30 metres north
30 metres east
40 metres north
70 metres west
30 metres south
40 metres west
30 metres south
20 metres east
35 metres south
75 metres east
25 metres south
60 metres east
95 metres north
15 metres east
40 metres north

IN TIME FOR CRIME?

All the suspects took the bus to visit the bank on the day it was robbed. The police have been able to work out when the suspects got on the bus, and what bus they took and at what time they arrived at the bank. The bank was robbed at 11:05 am, so any suspect who arrived after 11:05am can be crossed off the suspect list.

CROSS ANY SUSPECTS WHO ARRIVED AT THE BANK AFTER 11:05AM OFF THE SUSPECT LIST.

(hint: add the time travelled together between locations. i.e taking bus C from cinema → post shop → bank = 3min + 2min = 5min).

REMEMBER THERE ARE 60 MINS IN AN HOUR

BUS ROUTES

BUS A	Farm → Zoo → Church → Shops → Park → Offices → Motel → Bank
BUS B	Fire Station → Supermarket → Police → Park → Offices → Barber → Bank
BUS C	Hotel → Shops → School → Park → Cinema → Post Shop → Bank

SUSPECT	BUS TAKEN	STARTING POINT	LEAVING TIME	JOURNEY TIME	ARRIVAL TIME
Happy Harry	C	Shops	10:50		
Gruff Griff	A	Park	10:59		
Heroine Hilda	C	Offices	10:57		
Musical Molly	C	School	10:52		
Paperboy Paul	B	Super	10:55		
Sumo Sam	B	Barber	11:00		
Tinkerbell Tina	A	Farm	10:		
Rich Rupert	A	Church	8:48		

PREVIEW

Thanks for looking
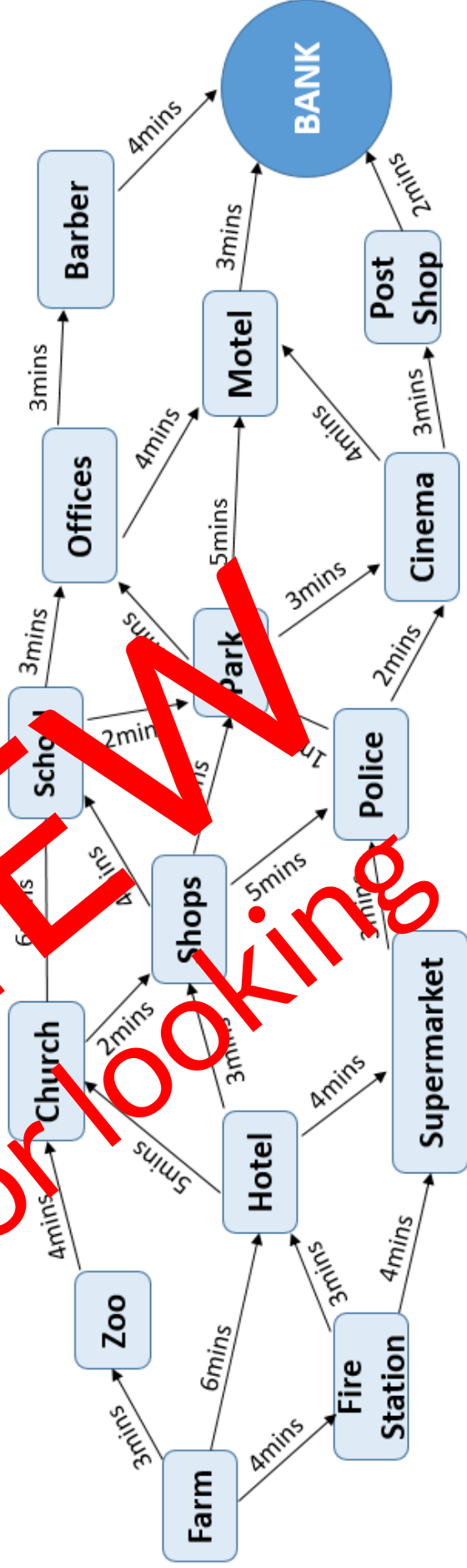
HIDDEN MESSAGE – MEASURE

The criminal left behind a hidden message at the crime scene and the police need your help to crack the code. **Calculate the area of each of the shapes below. Match the answers up to a letter using the table at the bottom (e.g. A=1). Fill in the missing spaces in the message at the bottom using the answers from the questions.**

To work out area multiply width x length. You will need to measure the sides with you ruler to find the width and the length in CM. – DO NOT measure in inches.

Q1/

5cm

4cm

Area = WxL
Area = 4x5
Area =

Q2/

Area = WxL
Area = 4x2
Area =

Q3/

Area = WxL
Area =

Q4/

Area =

Q5/

Area =

Q6/

Q7/

Q8/

Q9/

Q10/

Q11/

Use the answers to the questions and the table below to complete the message at the bottom.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26

CRIME WAS _____ COMMITTED BY

Answer Q1 Answer Q2 Answer Q3   Answer Q4 Answer Q5 Answer Q6

Answer Q7 Answer Q8 Answer Q9 Answer Q10 Answer Q11

TRACKING THE CRIMINAL – (INCHES)

After the crime the criminal escaped from the bank and their path was tracked using a sniffer dog. Some witness reported seeing suspects in different parts of the city after the crime.

Track the path of the criminal using the table on the side. Any suspect who was NOT seen along the path of the criminal can be crossed off the suspect list. Hint – stay on the roads

PATH OF CRIMINAL

SCALE
1INCH = 10m

From Bank
Criminal went

5 metres east,
12 metres north
12 metres east
15 metres north
30 metres west
12 metres south
13 metres west
12 metres south
7 metres east
13 metres south
28 metres east
9 metres south
25 metres east
38 metres north
5 metres east
15 metres north

Paul seen Here

Tina seen Here

Harry seen Here

Hilda seen Here

Sam seen Here

Griff seen Here

Start Here

Rupert seen Here

Molly seen Here

HOUSE MAKE OVER

Awesome work, you've caught the criminal. The public have got together and decided that as a reward they will redo your house how ever you like! Design your own house or room with anything you want in it – you just need to work out the area of everything you put in. Draw it below and then work out the areas of each feature you put in. What's going to be in your room or house? A pool table? A bowling alley? A card table? – It's up to you!

Feature 1: _____
Area:

Feature 2: _____
Area:

Feature 1: _____
Area:

Feature 2: _____
Area:

Feature 1: _____
Area:

Feature 2: _____
Area:

THE PHARAOH'S TOMB

Bang! You feel the wizz of the bullet fly past your hair. "Faster", you scream at your horse as you gallop along the city's streets. In the distance you see the edge of the city and beyond that, the vast desert – your chance for escape. This old map in your hand better be worth it. After winding your way through the city streets you slowly lose your pursuers and are soon speeding off into the desert. The wind blows in your hair and the sun beats down onto your face as you laugh to yourself - "ha – I got it – the map to the ancient pharaoh's tomb, this is going to make me rich".

Six days later you finally arrive at the Cliffs of Eternity. The map has the tombs entrance marked as being near the bottom of the cliffs. After hours of searching you finally find the entrance hidden behind a small cactus. It's a small hole in which you manage to squeeze through. Eventually the hole gets larger and soon you find yourself falling into a room. Thud! "Ahh", you groan – and then you look up at the sight before you. "Yes!" you shout – you have made it to THE PHARAOH'S TOMB!

All is not as it seems. On the next few pages are a series of questions and puzzles which you will need to solve so you can get out safely with the treasure. Come back here and fill in the blank boxes below when you know the answers


What do you need to do on mummies coffin?

Spell on stone to break curse reads:

How many marbles do you need to take all the treasure?

BREAK THE CURSE

You spot the treasure but before you can take it the legend says you must say the spell on the pharaoh's stone to break the curse. You spot an old stone in the corner with writing on it -that must be the stone! Underneath is a message but it is written in ancient Egyptian. The stone has both English and ancient Egyptian letters on it. Use the stone to read the message

Decode the message to find the words to say to break the curse.
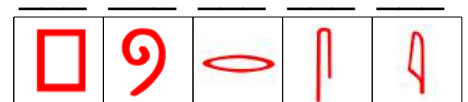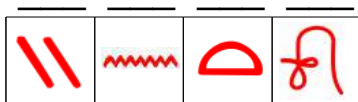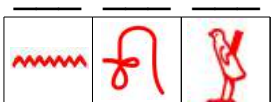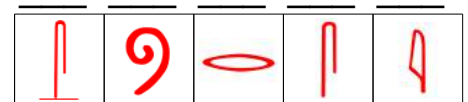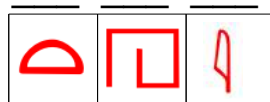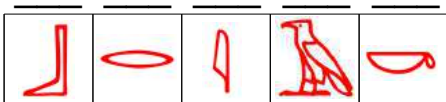
THE MUMMY STIRS

You hear a grumble coming from the coffin – The mummy is waking. On the ground beside the mummy is a tablet, you brush off the sand and use the pharaohs stone to translate the message – it reads – to stop the mummy you must do this on his coffin...but all it has next is a mix of numbers and multiplication questions! Use the answers to the questions to find the message.

34	34	1	33	33	13	13	17	17	17	75	75	75	75	92	92	7	7	7	62	62	62	62
34	34	1	1	43	13	13	5	17	17	21	21	21	83	92	92	43	7	7	7	62	51	54
22	54	1	1	43	43	5	5	5	17	33	33	56	83	83	43	43	1	61	61	61	51	54
22	54	54	54	43	61	61	5	33	33	33	56	56	83	43	43	1	1	1	19	19	51	54
22	29	61	61	7	61	61	47	47	51	33	33	56	7	7	75	1	1	19	19	19	61	61
29	29	5	61	7	62	62	54	47	51	16	16	16	7	7	75	75	22	13	17	17	61	
47	47	5	61	7	62	62	54	54	51	62	62	2	2	2	2	22	22	13	13	13	54	
92	72	72	72	83	6	6	6	75	36	62	5	55	81	22	32	32	22	11	11	11	54	
92	92	28	83	83	62	70	75	75	36	29	81	22	48	13	13	13	49	51	51	51		
61	61	28	17	83	62	70	55	55	36	47	22	48	48	48	13	49	49	49	7			
75	61	28	17	34	62	70	72	29	40	75	81	22	48	13	13	7	7	7	49	2		
75	75	28	17	34	15	15	32	36	29	40	75	81	22	12	12	12	19	14	14	14	2	
7	7	92	92	34	34	51	51	51	75	75	5	29	29	29	19	19	34	19	19	19		
7	20	92	13	9	80	19	30	5	25	25	25	19	42	34	34	63	75					
55	20	27	13	9	18	43	80	19	92	4	64	17	17	17	42	34	63	7	75			
55	20	27	13	13	43	18	80	19	30	92	64	33	33	17	42	63	7	7	62			
2	20	75	27	62	9	22	18	80	19	30	92	61	64	33	33	17	42	22	8	62	62	
2	20	75	27	62	9	22	18	80	34	30	30	4	61	10	10	10	7	42	22	43	8	62
2	33	33	33	62	62	22	34	34	34	54	54	54	61	61	7	7	7	22	22	43	43	43

To revel the messsage work out the answers to the questions below and then find the same numbers in the number mix above – shade in the squares with these numbers.

4x5____	5x5____	9x4____	6x5____	10x8____
2x3____	4x7____	5x3____	8x7____	3x4 ____
4x4____	8x5____	2x2____	8x4____	8x9 ____
8x6____	6x3____	7x9____	2x7____	3x9 ____
6x7____	2x5____	3x3____	9x9____	7x10____
3x7____	7x7____	11x1____	2x4____	8x8 ____

TAKE THE TREASURE - IF YOU DARE

The curse is broken – the mummy is asleep – time to raid the treasure. As you step into the treasure room you gasp at vast wealth before you. You are about to raid the treasure but then see a warning on the wall – if you take the treasure you will be trapped forever.

The treasure is connected to a weighing system. If you take the treasure you will need to replace it with something that weighs the same or else the tomb will collapse and you will be trapped.You find some marbles in your bag – they will be perfect to replace the jewels with.

1 emerald is the same weight as 1 marble   *Emerald* 🟢 = 🔵 *1 marble*

1 ruby is the same weight as 2 marbles   *Ruby* 🔴 = 🔵🔵 *2 marbles*

1 diamond is the same weight as 3 marbles   *Diamond* 🔷 = 🔵🔵🔵 *3 marbles*

The treasure is on plates.
How many marbles do you need to put onto each plate so you can take the treasure?

EXAMPLE		
Example Treasure Plate: Has 3 emeralds and 2 rubies	Number of emeralds: **3**	Marbles needed: 3x1 = **3**
	Number of Rubies: **2**	Marbles needed: 2x2 = **4**
		Total number of marbles needed: **3 + 4 = 7**

Treasure Plate 1
Has 2 emeralds and 3 rubies

Marbles for emeralds:	
Marbles for rubies:	

Total marbles_____

Treasure Plate 2
Has 2 emeralds and 1 diamond

Total marbles_____

Treasure Plate 3
Has 4 emeralds, 2 rubies and 2 diamonds

Total marbles_____

Treasure Plate 4
Has 6 rubies, and 3 diamonds

Total marbles_____

Treasure Plate 5
Has 10 emeralds, 5 rubies, and 7 diamonds.

Total marbles_____

You then see some gold and silver on plates at the back of the room. The silver pieces weigh the same as 4 marbles and the gold weighs the same as 6 marbles. How many marbles do you need for the following plates?

Treasure Plate 6
Has 2 gold pieces and 3 silver

Total marbles_____

Treasure Plate 7
Has 4 gold pieces and 7 silver

Total marbles_____

ESCAPE THROUGH THE LABYRINTH

Nice work – your bag is now stuffed full with treasure. A rumble comes from behind you and a huge rock blocks off the entrance to come in. Hmm, how do I escape now you think to yourself.

On the wall of the tomb room beside a small door is a map of what looks to be a giant maze. A message is underneath the map which reads:

To escape the tomb you must find a pass through this labyrinth. But beware the labyrinth is boobytrapped and you may only go through numbers which are even. If you go through an odd number you will set off the boobytrap and be trapped forever!

Find your way through the maze and only go through even numbers
Hint: Even numbers can be halved (2,4,6...), Odd numbers can't be halved (3,5,7...)

EARLY FINSHER ACTIVITY

WRITE YOUR NAME IN EGYPTIAN HIEROGLYPHICS

USE THE PHARAOH'S STONE FROM THE FIRST PAGE TO HELP YOU WRITE YOUR NAME
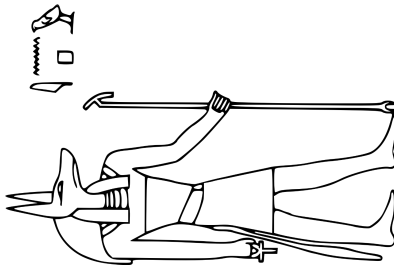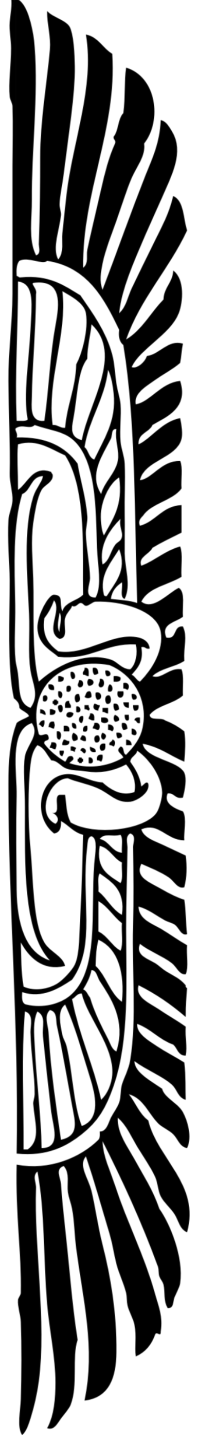
EARLY FINSHER ACTIVITY

The tomb is now quiet, the mummy is asleep and the treasure has gone. As the mummy sleeps it remembers long ago when he was Pharaoh (ruler) of all of Egypt. Over 4000 years ago he ruled a vast empire -those times were full of excitement.
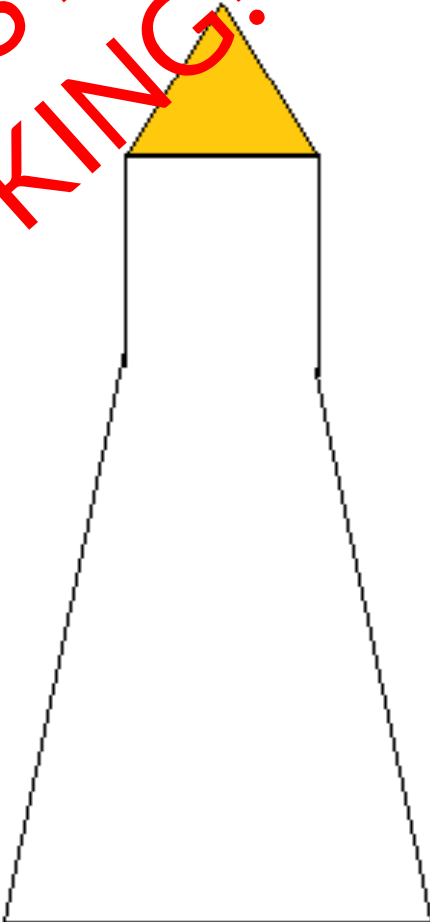
Imagine you were Pharaoh 4000 years ago, write a story of an interesting event that happened in your life.

Ideas: A great battle, building your tomb, getting lost in the desert, how you became the pharaoh, building of a great city.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Many Egyptain Pharaohs had great stone monuments built with carvings and drawings about their life on them so they would always be remembered. These were called obelisk. **Design your own obelisk below, what would you put on it?**
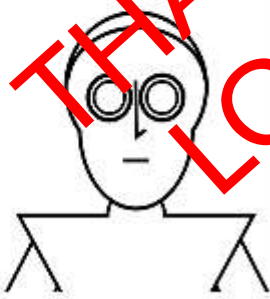
_____

_____

_____

_____

_____

_____

_____

MATH DETECTIVES
CRIME SCENE INVESTIGATION

The fate of the Earth is in your hands. You work for an undercover government agency who keeps track off all the aliens here on Earth. Last night an alien broke into your secret facility and stole the deadly ray gun - this ray gun could destroy the world. Your job is to find out which of the aliens below stole the gun and then stop them before they can use it.

One of the eight aliens below committed the crime and the galactic police need your help to find out who.

THE ALIENS

YOUR TEAM HAS FOUND 4 CLUES WHICH ARE ON THE NEXT PAGES.

AFTER YOU HAVE SOLVED EACH CLUE COME BACK HERE TO CROSS ALIENS OFF THE SUSPECT LIST UNTIL YOU HAVE FOUND THE CRIMINAL

CLUE 1: HIDDEN MESSAGE

An unknown alien rushes into the room waving its arms around. You think it wants to tell you something about the aliens, but the problem is this alien can't speak English, it speaks in a funny math language. To be able to translate the aliens message you will need to first solve the questions it asks you below.

Solve the problems, then fill in the message spaces with the letters that match the correct answers to read the secret message. This will let you cross off two aliens from the suspect list.

A 4X5 ___	B 7X7 ___	C 2X7 ___	D ___	E 7X8 ___	F 3x5 ___
G 2X9 ___	H 6X6 ___	I 2X___	J 4X4 ___	K 3X4 ___	L 3x8 ___
M 6X7 ___	N 5X___	O ___X6	P 9X9 ___	R 4X8 ___	S 9x8 ___
T 9X5 ___	U 7X___	W 3X9 ___	Y 6x___		

___ 21 ___ 35 ___ 32 ___ 8 ___ 25 ___ 18   ___ 45 ___ 36 ___ 56

___ 32 ___ 30 ___ 49 ___ 49 ___ 56 ___ 32 ___ 48   ___ 45 ___ 36 ___ 56

___ 20 ___ 24 ___ 8 ___ 56 ___ 25 ___ 72   ___ 14 ___ 20 ___ 24 ___ 24 ___ 56 ___ 21

___ 12 ___ 24 ___ 30 ___ 32 ___ 15   ___ 20 ___ 25 ___ 21   ___ 24 ___ 56 ___ 24 ___ 20

___ 27 ___ 56 ___ 32 ___ 56   ___ 20 ___ 45   ___ 45 ___ 36 ___ 56

___ 72 ___ 81 ___ 20 ___ 14 ___ 56   ___ 16 ___ 20 ___ 42   ___ 81 ___ 20 ___ 32 ___ 45 ___ 48

Since these aliens couldn't of committed the robbery, cross them off your suspect list.

CLUE 2: ALIEN SPACE SHIPS

You have confiscated the space-ships of all the aliens. The ray-gun can be broken into parts for easy transport but would still take up a large amount of space. After scanning the ships you can see the amount of room each ship has available for carrying extra cargo. The two ships with the least amount of space wouldn't be big enough to fit the ray gun.

Which two spaceships have the smallest amount of total square area inside? (TOTAL SQUARE AREA IS ONLY THE WHITE INSIDE PART OF THE SHIPS)

Hint: To calculate area you can either **count the number of squares** in each ship **OR** break the area up into parts and multiple length x width for each part.
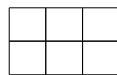
e.g. as an area of 6 squares
x 2 = 6
length x (width)

Zoltars Ship
Amount of squares (area):
_____

Norges Ship
Amount of squares (area):
_____

Klorfs Ship
Area:
_____

Arimals Ship
Area:
_____

Lelas Ship
Area:
_____

Swaxas Ship
Area:
_____

Nukeers Ship
Area:
_____

Yhocorhs Ship
Area:
_____

Which 2 alien ships had the smallest area? Cross these aliens off your suspect list
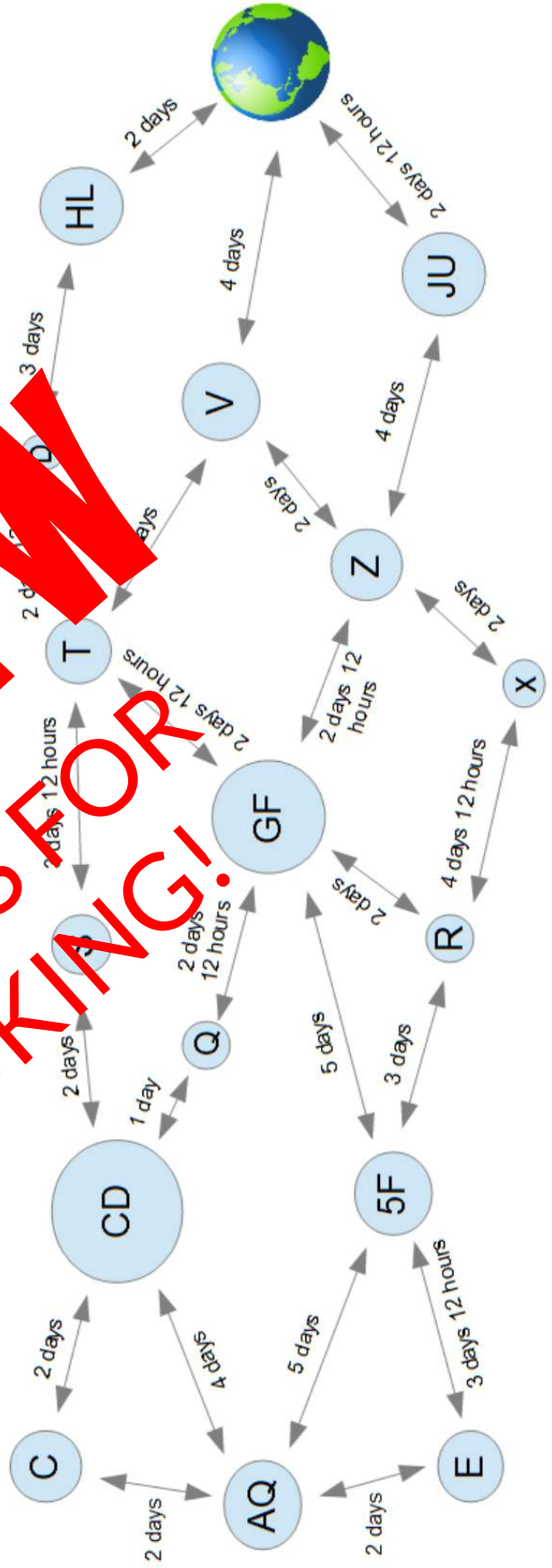
CLUE 3: SPACE TRAVEL

The aliens all travelled vast distances to get to Earth. The galactic... ...e have found out which route the aliens took to get to Earth and when they left their home planet, but they need your help to find out when they arrived on Earth... ...un was stolen on Earth... ...e ra... ...sun was stolen on the 24th of November, so any alien which arrived after this date must be innocent.

CROSS ANY ALIENS WHO ARRIVED ...TER 24th NO...EMBER OFF THE SUSPECT LIST
(Hint: Just add the travel times between the planets, e.g. To go fr... ...plan... – JU – Earth is (4 days + 2 days 12hours = 6days 12hours or 6.5days).
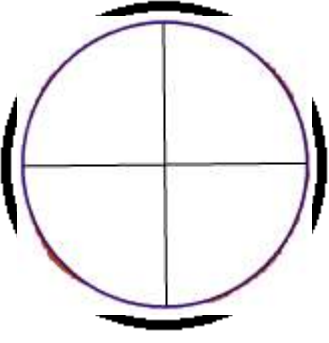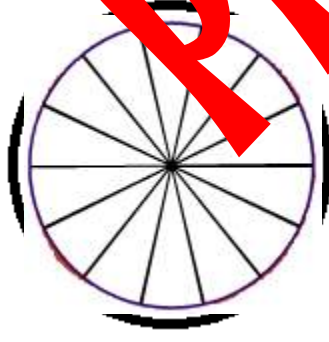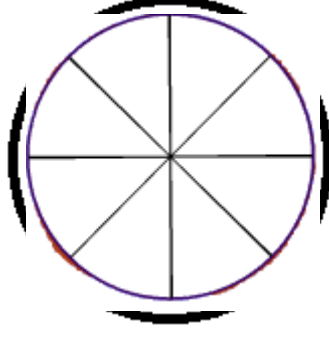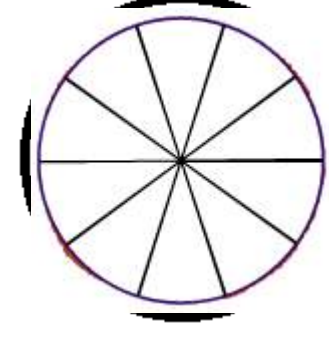
ALIEN	TRAVEL ROUTE	...JOURNEY	LEAVING TIME (all left at 12am, start of the day)	ARRIVAL AT EARTH
ZOLTAR	X→Z→V→EARTH		14th November:	
NORGAL	S→T→V→EARTH		7th November:	
KLORF	D→HL→EARTH		16th November:	
ARAIMAL	C→CD→Q→GF→Z→V→EARTH		12th November:	
LELA	R→X→Z→JU→EARTH		9th November:	
SWAXA	E→5F→R→X→Z→V→EARTH		2nd November:	
NUKEER	5F→GF→Z→JU→EARTH		5th November:	
YHOCORH	AQ→CD→S→T→V→EARTH		10th November:	

Diagram (planet network with travel times):

HL → Earth: 2 days
JU → Earth: 2 days 12 hours
V → JU: 4 days
... → HL: 3 days
Z → V: 2 days
JU → Z: 4 days
Z → X: 2 days
T → ...: 2 days 12 hours
GF → T: 2 days 12 hours
X → R: 4 days 12 hours
GF → R: 2 days
GF → X: 2 days 12 hours
Q → GF: 2 days 12 hours
CD → Q: 1 day
5F → GF: 5 days
R → 5F: 3 days
5F → E: 3 days 12 hours
CD → AQ: 4 days
C → CD: 2 days
AQ → 5F: 5 days
C → AQ: 2 days
AQ → E: 2 days

CLUE 4: WHOSE GOT THE ENERGY?

All aliens on Earth wear a special energy converter which lets them be transformed so they appear to look like humans. Stealing the ray gun would have drained a large amount of energy from one of these converters. You determine that the alien who still has the most amount of energy charge left on their converter couldn't have committed the crime.

Which Alien has the most amount of charge on their converter?
(Hint – Shade in the fractions on the converters to help you compare)

(Shade in the charge) Zoltar converter charge is at $\frac{3}{4}$	(Shade in the charge) Lela converter charge is at $\frac{10}{15}$
(Shade in the charge) Morgan converter charge is at $\frac{2}{3}$	(Shade in the charge) Swaxa converter charge is at $\frac{10}{12}$
(Shade in the charge) Klorf converter charge is at $\frac{9}{14}$	(Shade in the charge) Nukeer converter charge is at $\frac{4}{6}$
(Shade in the charge) Araimal converter charge is at $\frac{5}{8}$	(Shade in the charge) Yhocorh converter charge is at $\frac{5}{10}$

Cross the alien with the most amount of energy off your suspect list

EXTENSION ACTIVITY:
FIND THE RAY GUN

Well done commander, you found which alien committed the crime!

You look over to the alien and he snarls at you. "You were better then I thought, but if you arrest me you will never find the ray-gun, you would need to be able to fly my spaceship for that and it has a special code which only I know." You smile to yourself and whisper back to the alien, "Breaking codes is what I do best."

After arriving at the alien's ship you look down at command center – you need to enter the correct numbers into the right spots in order to fly the ship so you can retrieve the ray-gun.
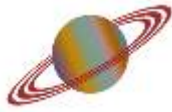
DIRECTIONS" Fill in each circle with a number from the number bank. Each number can only be used once. The three circles which connect to the middle star must have numbers which add up to the middle number (21).

NUMBER BANK

5	9	11	3	1
6	15	4	10	12

EXTENSION ACTIVITY 2:
FLY ANYWHERE

Draw a picture of your travels

Nice work, now you have an alien space ship which you can fly anywhere in the universe. Write a story about where you are going to go and what happens.
(Do you meet aliens, visit a new planet – what's it like, are you in a massive space battle or do you become queen or king of an far off alien planet? - it's up to you. Be creative as you can!)

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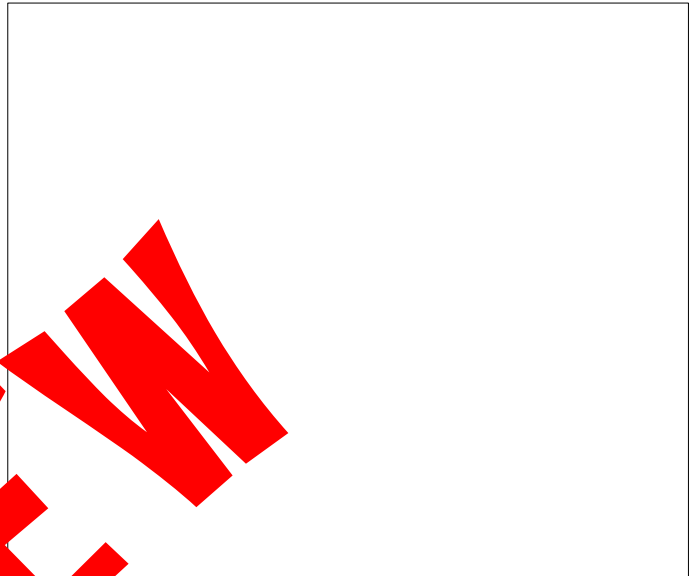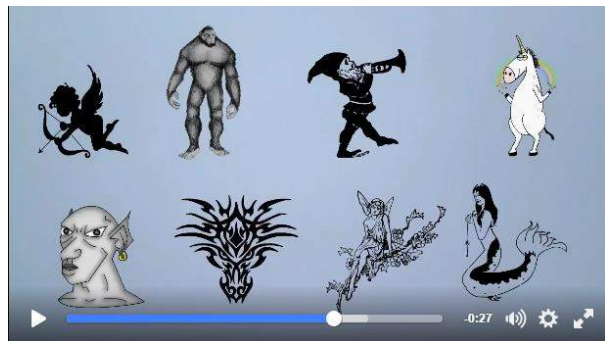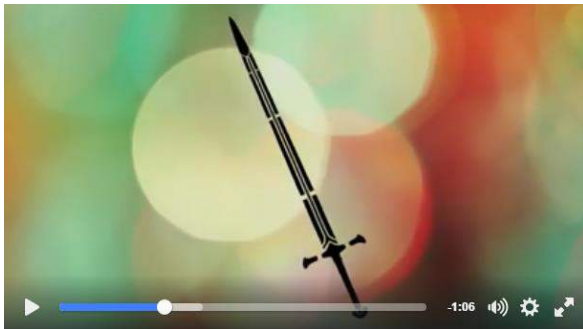
VIDEO "HOOK"

A one and half minute video which can be used to hook your students into the math activity!

PREVIEW
THANKS FOR LOOKING!

CRIME SCENE INVESTIGATION
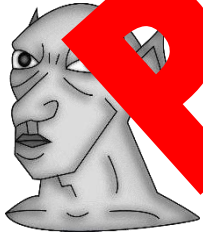
King Arthur is Furious!

Someone has taken his magic sword Excalibur. It has been foretold that without his magic sword King Arthur will no longer be able to rule. Camelot and the entire kingdom will fall into ruin unless we can help find who took his sword. .....

Only a magical creature or person can touch the sword. This means that whoever stole the sword must be a magical being. The kingdom has been searched and all the magical beings have been questioned.

The most likely suspects were gathered up and are shown below. One of these suspects is thought to have stolen Excalibur. Use the evidence on the following pages to find out which one committed this terrible act. The King needs you – the whole kingdom is depending on you finding that sword so peace can be restored to the region.

Suspect 1 **Gary the Unicorn**	**Suspect 2** **Gnome**	**Suspect 3** **Bigfoot**	**Suspect 4** **Fairy Princess**
Suspect 5 **The Orc Lord**	**Suspect 6** **Cupid**	**Suspect 7** **Dragon King**	**Suspect 8** **Mermaid**

FIVE CLUES HAVE BEEN FOUND WHICH ARE ON THE FOLLOWING PAGES.

AFTER YOU HAVE SOLVED EACH CLUE COME BACK HERE TO CROSS PEOPLE OFF THE SUSPECT LIST UNTIL YOU HAVE FOUND WHO STOLE THE SWORD

HIDDEN MESSAGE

A scroll was found attached to the rock which Excalibur was once stuck in. On it is a coded message, which once cracked will allow us to eliminate one person from the suspect list.

Solve the problems, then fill in the message spaces with the letters that match the correct answers to read the secret message.
This will let you cross off one person from the suspect list.

Hint. When a number is not known it can be replaced with a letter.

For example. There where 3 lollies, now there is only one.
In an equation it looks like this: 1+L = 3 $\longrightarrow$ 1+2 =3 $\longrightarrow$ L=2

↖ L can be used to show the unknown number lollies that have gone.

Another example. 2xC = 10 $\longrightarrow$ 2x5 =10 $\longrightarrow$ C=5

A	B	C	D	E	F	G
10-A = 2	3xB = 18	C+11 =22	11–D = 9	6x...	Fx... 0	12+13 =G
A = ____	B = ____	C = ____	D = ____	E = ____	F = ____	G = ____

H	I	J	K	L	M	N
4xH = 16	25-I = 15	9x3 = J	1...+17	3...	6x8 = M	...= N
H = ____	I = ____	J = ____	K = ____	L = ____	M = ____	N = ____

O	P	Q	R	S	T	U
5x6 = O	Px6 = 54	...Q =53	10...23	3x7 = S	...x... = 28	9x9 = U
O = ____	P = ____	Q = ____	R = ____	S = ____	T = ____	U = ____

V	W	X	Y	Z		
34+42 =V	8x7 = ...	...4 =X	4x7 = Y	...+... = 61		
V = ____	W = ____	X = ____	Y = ____	Z = ____		

___ ___ ___ ___   ___ ___ ___ ___ ___ ___   ___ ___ ___
 7   4 10 21   48 ... 21 21 8 25 36   56 8 21

___ ___ ___ ___   ___ ___ ___ ___ ___ ___   ___   ___ ___ ___ ___
3 36 5   7   6 11 8 81 21 36   10   4   8 7 36

___ ___   ___ ___ ___   ___ ___ ___ ___   ___ ___ ___   ___ ___
7 30   21 36 36   7   4 10 21   30 63 36   8 21

___   ___ ___ ___ ___ ___ ___ ___.   ___ ___   ___ ___ ___
 8   21 81 21 9 36 11 7   10 7   56 8 21

___ ___ ___   ___ ___ ___ ___.
63 30 7   25 8 13 28

CROSS THIS PERSON OFF YOUR SUSPECT LIST.

THE TREASURER HAS FLED!

The city of Camelot and Arthurs Kingdom are starting to fail. There are enemies starting to appear on all sides and riots have started in the streets. The kings treasurer has run away due to being frightened about the state of the kingdom. Before he ran way he was calculating how much gold each suspect had because whoever took Excalibur would of needed at least 40 gold bars to do so. All that the treasurer left were these equations on pieces of paper. Find the answers to these equations to find out how many gold bars each suspect has.

When calculating the answers remember these following tips:

P Parentheses / Brackets
E Exponents: e.g. 3^2
M Multiplication
D Division
A Addition
S Subtraction

Use PEMDAS to make sure you calculate the right part of the equation first. Parentheses (Brackets) are always calculated first, multiplication and division are done before addition and subtraction.

1, The *Parentheses* (*Brackets*) always g_ calculated first
S_ 2x2_(2+3) ⟶ 2x2 + 5 = 9

A_ _nce they are inside
the _rent_ (bracket). 2+3 = 5.

ltiplicati _nd division alway_
_es before addition and su_tra_tion!
_+2x5 ⟶ 4_10_1

Always do the _ultiplication before the _ddition. 2x5 =10.

Any suspect who has a to_ of _ess than _0 gold bars c_ _e crossed off the list.

(6+3) x 7	_0 + _	100 _5x8	(50+45) – (3x8)
Gary the unicorn	Gnom_	Bigfoot	Fairy Princess
(30-22) x 9	7_1_ – _3x5)	2x4 x(4+4)	(60 - 50) x 6
The Orc Lord	Cupid	Dragon King	Mermaid

Cross off any suspect who has a total of less than 40 off the suspect list.

Journey of the creatures

One day after Excalibur was taken the location of all the suspects was known. It is thought that no one could of travelled more than 12 miles in a day. This means that anyone who was more than 12 miles away from Camelot can be crossed off the suspect list. Arthur got out his map, but many of the distances where missing.

Use the clues below to work out the missing distances.

It is the same distance from the ruins as it is from the tower to Camelot.	**Distance of R =**
It is double the distance from the black forest to the tower as it is to go from the ruins to Camelot.	**Distance of B =**
To go from the sea to the black forest to the Camelot is a total distance of 13 miles.	**Distance of S =**
To go from the lily pond to the mountains to Camelot is a total distance of 14 miles.	**Distance of M =**
It is half the distance from the cloud city to the mountains from the sea to the black forest.	**Distance of C =**
It is half the distance from the treasure horde to Camelot as it is to go from the lily pond to Camelot.	**Distance of T =**

Work out how far away each suspect was and cross anyone who more than 12 miles away off the suspect list.

SPECT	Where they were	Distance from Camelot
Gary	Tower	
Gno	ck Forest	
B	M ns	
Fairy P	ly Pond	
The Orc Lord	Ruins	
upid	Cloud City	
Dr on King	Treasure Horde	
Mermaid	Sea	

Camelot

3miles

Tower

T = ?

Treasure horde

Sea

S = ?

B = ?

Black Forest

Cloud

C

M = ?

ountains

miles

Lily Pond

R = ?

Ruins

WHO HAS THE POWER

All magical creatures can enhance their magical powers by using gemstones. To use Excalibur a creature needs to have enough gemstones to raise them to a magic level of above 40. Any suspect who doesn't have enough stones to give them a magic level of above 40 can be crossed off the list.

All of the gemstones from each suspect have been gathered. Different gemstones have different amounts of power. The amount of power that each gemstone has is in the table below.

Calculate the total magic level each suspect has.

Cross any suspect who has a total of magic level of less than 40 off the suspect list.

Jade	Topaz	Pearl	Moon Stone	Emerald
2 Magic Levels	4 Magic Levels	5 Magic Levels	6 Magic Levels	7 Magic Levels

Hint: To calculate amount of magic multiply number of stones by their power level.
e.g. Three Jade stones = 3 x 2 = 6 magic.

Gary the Unicorn: 9J + 3T + 2E

9J = 9 Jade, = 9x2= _____magic

2T= 3 Topaz = 3x4= _____ magic

2E= 1 Emerald = 2x7 = _____ magic

Total amount of magic = _____

Gnome: 4T + 5P + 2M

4T = 4 Topaz = _____ magic

5P = 5 Pearl = _____ magic

2M = Moonstone ___x___ = ____magic

Total amount of magic _____

BigFoot: 4J + 2P + 1M + 2E

4J = _____ magic

2P = _____ magic

1M = _____ magic

2E = _____ magic

Total amount of magic _____

Fairy Princess: 3T + 1P + 4M + 3E

3T = _____ magic

1P = _____ magic

4M = _____ magic

3E = _____ magic

Total number of magic = _____

The Orc King: 6J + 7T + 2P + 3M

Total amount of magic = _____

Cupid: 7J + 1T + 2E

Total amount of magic = _____

Dragon King: 1P + 6M + 4E =

Total amount of magic _____

Mermaid: 4T + 6P + 3E =

Total amount of magic _____

THE SOLDIERS ARE MARCHING!

Whoever stole Excalibur must be planning to attack Camelot soon. However the sword alone would not be enough to conquer Camelot, an army would also be needed. It is known that an attack is planned in 6 weeks time and even with Excalibur it would still take at least 100 soldiers to conquer Camelot.

The current amount of soldiers each suspect has is known. It is also know how many soldiers each suspects gains (or loses) in a week.

Calculate how many soldiers each suspect will have at the end of week 5.

Cross off any suspect who will have under 100 soldiers at the end of week 5.

Suspect	Staring number of soldiers	End of Week 1	End of Week 2	End of Week 3	End of Week 4	End of Week 5
Gary Gains 10 a week	60 →	**70**				
Gnome Gains 5 a week	80					
Bigfoot Doubles every week	4					
Fairy Gains 2 a week						
Orc Loses 5 a week						
Cupid Gains 3	86					
Dragon Gains 9	65					
Mermaid Loses half every week	4000					

Bonus Question:

Do you notice any pattern above for each suspect? A formula can be created to show how many soldiers each will have.

For example Gary's formula looks like this: Soldiers = (Week number x 10) + 60

So at the end of 10 weeks he will have (10 x 10) + 60 = 160 soldiers.

How many will he have at the end of 20 weeks?

See if you can work out a formula for the other patterns, on a separate bit of paper see if you can calculate how many soldiers they will have after 10weeks and 20 weeks!

MY LIFE...

Choose one of the suspects and pretend you are them. Write a story from their life – it could be short story about something that has happened to them, or perhaps a tale of how they grew up. Maybe they weren't always a magical creature, or maybe they are really a good being inside but have been rejected by others because they were different. It's up to you – be as imaginative as you can!

_____

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Draw a picture here.

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CREATE YOUR OWN MESSAGE

Create your own hidden message!

Write an equation for each letter to give it a number.
For example, A has been done for you 4+A = 2 $\longrightarrow$ A must then = 2

Then fill in the message space with the number that match the letters you want the message to say.

For example if you want to write an A, put this $\longrightarrow$ ___
2

A 4+A=6 A = ____	B B = ____	C C = ____	D D = ____	E E = ____	F F = ____	G G = ____
H H = ____	I I = ____	J J = ____	K K = ____	L L = ____	M M = ____	N N = ____
O O = ____	P P = ____	Q Q = ____	R R = ____	S S = ____	T T = ____	U U = ____
V V = ____	W W = ____		Y Y = ____	Z Z = ____		

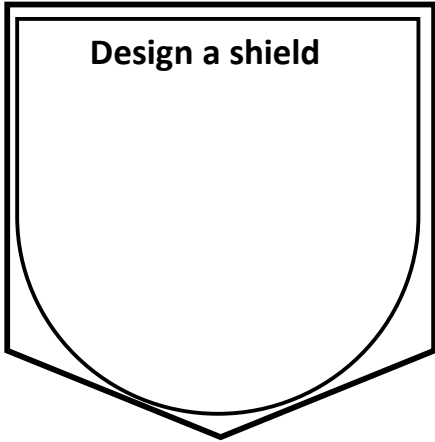**MESSAGE**

___
Put line with numbers
underneath here to write
your hidden message

DESIGN A KNIGHT

King Arthur had a circle of knights who helped him rule his kingdom. Design one of these knights. Draw and write about what he is wearing, create shield and design a motto for him (saying).

Design a shield

Write a motto for your gladiator

Draw and write about what your knight is wearing

HEADWEAR: _____

_____

_____

_____

CLOTHES OR ARMOR: ____

_____

_____

_____

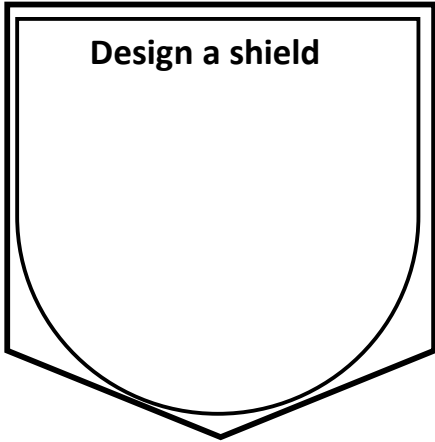**WEAPON:** _____

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_____

FOOT/LEG WEAR: _____

_____

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_____

PREVIEW

THANKS FOR LOOKING!

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WEAPON: _____

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FOOT/LEG WEAR: _____

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_____

PREVIEW

THANKS FOR LOOKING!