



# BUILDING THE

# Future



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HI THERE! WE'RE **DUKE** AND **TEDDY** FROM **ON THE MARK LAND SURVEYING**, AND WE'VE BEEN VERY BUSY IN THE TOWN CENTRE FROM THE GET KIDS INTO SURVEY PROPERTY DEVELOPMENT EXPLORATION POSTER! WELL, WE'VE ACTUALLY BEEN A BIT DISTRACTED BY A LASER -- BUT YOU CAN'T BLAME CATS FOR THAT! CAN YOU HELP US GET DOWN TO BUSINESS? WE'VE GOT BIG PLANS FOR A NEW BUILDING THAT WOULD BE JUST PUUUURFECT FOR OUR FELINE FRIENDS! LET'S GET TO IT!

## TASK 1: CONSTRUCTION COMIC

(GEOGRAPHY OBJECTIVES - GEOGRAPHICAL KNOWLEDGE AND FIELDWORK / LITERACY OBJECTIVES - CREATING EXPLANATION TEXTS)

So, we want to start a special building project, but there's so much that goes into construction that it's left us chasing out fluffy tails! Just look around the town - there's buildings in all different states of construction. From surveying and measuring to foundations and scaffolding - from cranes and frames to roof repairs and window work - it's all going on!

But how do you get started? What comes first? What order do the jobs need to be in? We've made a list of the type of construction activities we can see around the town - and we need your help to put them in order so we know what to do and when to do it! Use the Construction Comic worksheet to order the six activities into sequential steps that we can follow when we start our meowarvellous building project! then - and how hard you want our four-legged friends to work to get to the top! You can also plan in any equipment you think would make for furry fun, like a dog-friendly climbing frame, or a pooch-only football pitch!

BUILD A METAL FRAME TO GIVE THE BUILDING A STRUCTURE

SURVEY THE AREA USING A LASER SCANNER AND MAKE A PLAN

DIG FOUNDATIONS FOR THE WALLS OF THE BUILDING

CONNECT UTILITY PIPES FOR WATER, GAS AND ELECTRICITY

INSTALL FLOORS, WINDOWS AND DOORS

LAY DOWN GRASS FOR LAWNS AND STONE FLAGS FOR PATHWAYS

## TASK 2: THUMBS UP!

(GEOGRAPHY OBJECTIVES - PHYSICAL GEOGRAPHY / MATHS OBJECTIVES - MAKING MEASURES)

Once we managed to stop playing around with the laser scanner (aka a LiDAR scanner), we realised that a big part of construction is measuring. And those measurements have to be super-precise, too, because even small mistakes could cause big construction problems later on. But that got us thinking - what did builders do before laser scanners? What did they do before rulers and tape measures? How did anyone know the length of anything!?

Well, it turns out - if you look back in history far enough - you'll find some pretty interesting facts about how people measured things! For example, an inch originally equated to the width of a man's thumb! But different people have different sized hands, so that measurement

wasn't very reliable! At first, people tried improve consistency by adding up the thumb breadth of three men - one small, one medium, and one large - then dividing by three to get an average. Eventually, King Edward II of England ruled that one inch equalled three grains of barley placed end to end lengthwise. We guess they just had to hope that all the barley was the same size!

What can you find out about the history of units of measurement? What about a foot, or a span, or a cubit? Once you've found out about these mad, body-based measuring methods - try making some measurements with your own body! You could try measuring a game controller in thumb-width inches! Or measuring your bedroom door in 'hands'. Or see if you can measure the length of your living room in 'cubits' like the ancient Egyptians used! (Just get ready for some strange looks from your family!)

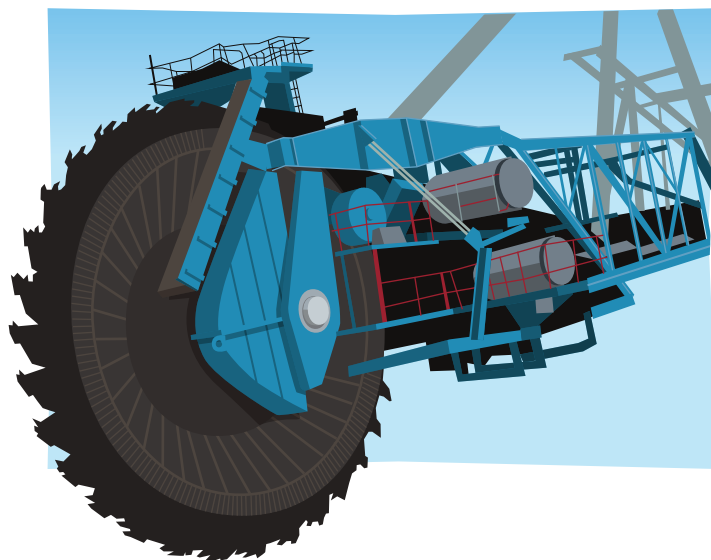


## TASK 3: MASSIVE MACHINES

Another thing we've noticed is that construction involves a whole lot of heavy machinery! Digging up earth, lowering metal beams, transporting heavy pipes, bricks and concrete mix - it's all done by some pretty mega machines! And yet, the cranes and excavators working in the town are tiny compared to the machines you can find on some sites around the world!

For example, the largest sawblade in the world can be found in the world's biggest single coal mine, the Bogatyr Mine, in Kazakhstan. It's so big it takes 27 people to operate it, and its blade alone is the size of a four-storey building!

Can you use the Massive Machines quiz sheet to find some more examples of colossal construction equipment? Then we can have them on standby - just in case our earth-moving machines aren't up to the task!



## TASK 4: ALL HAIL THE SCALE!

(MATHS OBJECTIVES - MAKING MEASURES AND SCALE & RATIO / D&T OBJECTIVES - DESIGN AND EVALUATE)

Well, thanks to you we now know the correct steps for our building project, and how to measure accurately (even if we lose our tape measures!), and we know all about the biggest and best building machines out there. We think it's time to reveal our plans for the town! We're planning to build... a cat sanctuary! You see - we noticed the dogs are getting their own play pool - and we don't like to be outdone by our ruff-ruff rivals!

That said, it turns out we need your help with the plans for the cat sanctuary too! Can you start by sketching out a building design for the On the Mark Cat Sanctuary - including windows and doors, signs and logos? You should also include the building's dimensions: its height, length and width.

Then, can you shift your plans into three dimensions and use your ratio and scale knowledge to build a basic model of the On the Mark Cat Sanctuary? You could use building bricks (e.g. Legos) - just make sure you decide on a scale before you start. If you have plenty of bricks, you could use a ratio like 1 brick = 1 foot, But if you have fewer bricks, you might want to adjust your scale - perhaps 1 brick = 5 feet. Let's get building!

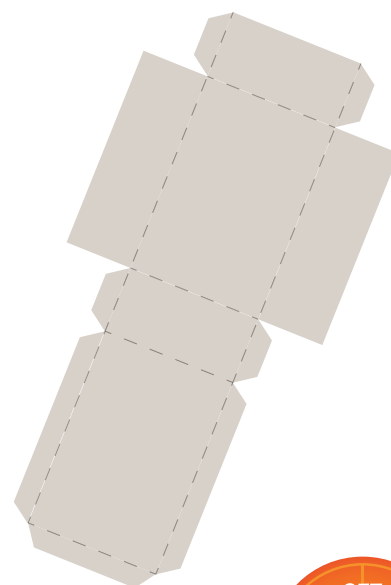
## TASK 5: SCALING SANCTUARY

(MATHS OBJECTIVES - MAKING MEASURES AND SCALE & RATIO / D&T OBJECTIVES - DESIGN, MAKE AND EVALUATE)

Part of what surveyors do is to make a building project or plan come alive for a client - usually by creating digital models that show them what the final building will look like. Can you help the townspeople and builders to imagine the On the Mark Cat Sanctuary even more clearly by turning your drawings and basic build into a proper scale model of the building?

Mark out a cuboid shape net on card (making sure the measurements are in scale with your building design), and add tabs so you can cut it out and glue it all together! You can also add the signs and logos from your sketch plans from Task 4 to make it look as realistic as possible.

Let's make this puuurfert, pawesome dream come true!



# BUILDING THE *Future*

## TASK 1: CONSTRUCTION COMIC

Use this worksheet to order the six activities into sequential steps that we can follow when we start our **meowarvellous** building project! The first one has been done for you!

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1 SURVEY THE AREA USING A LASER SCANNER AND MAKE A PLAN



2

3

4

5

6





## TASK 4: MASSIVE MACHINES

Can you use this quiz sheet to find some more examples of colossal construction equipment? Then we can have them on standby - just in case our earth-moving machines aren't up to the task! The first one has been done for you.

QUESTION	YOUR ANSWER
Where would you find the world's largest sawblade?	THE LARGEST SAWBLADE IN THE WORLD CAN BE FOUND IN THE WORLD'S BIGGEST SINGLE COAL MINE, THE BOGATYR MINE, IN KAZAKHSTAN. ITS BLADE IS THE SIZE OF A FOUR-STOREY BUILDING!
How tall is the world's tallest crane?	
What is 'BIG BERTHA', And what construction job does it do?	
Where is the deepest hole ever dug on earth - and how far down does it go?	
How much can the BELAZ 57510 dump truck hold?	
In BHP, how powerful is the LIEBHERR R9800 Excavator?	
How heavy is the DYNAPAC CC7200 - the world's biggest road roller?	