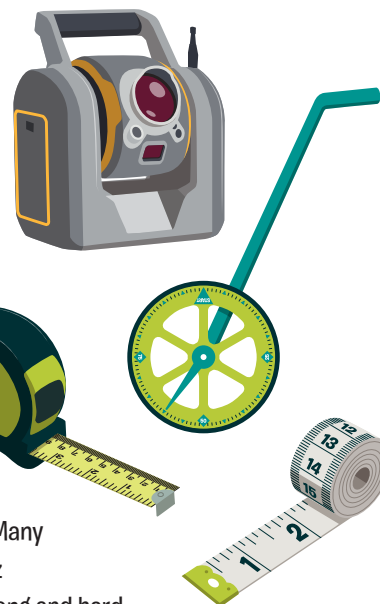


MASTERS OF MEASURES



HI! I'M **SPRUCE THE MOOSE** FROM **McELHANNEY**! LIKE YOU, I'VE BEEN EXPLORING THE GET KIDS INTO SURVEY FORESTRY EXPLORATION POSTER. DID YOU SPOT THE PESKY ALIEN AND THE DAMAGE IT CAUSED TO THE TREEHOUSE? THANKFULLY, I'M SOMETHING OF A TREEHOUSE SPECIALIST -- AND THE TEAM AT **McELHANNEY** HAVE ASKED ME TO DESIGN A NEW-AND-IMPROVED HANGOUT. BUT FIRST, I NEED TO SHARPEN MY MEASURING SKILLS -- CAN YOU HELP ME? MAYBE YOU CAN PITCH IN ON THE DESIGN TOO! LET'S GET STARTED!

SPONSORED BY **McElhanney**



TASK 1: MANY METHODS FOR MANY MEASURES

(MATHS OBJECTIVES - MAKING MEASUREMENTS)

Have you seen the multiple measurement methods being used in the Forestry Exploration Poster scene? We've got the GeoSurveyor in D,2 using a rangefinder to measure the height of a tree (more on that later!). Then there's the folk in the boat in D,3 using radar scanners to measure the river bed. We've even got Bigfoot helping out in G,3, using a laser scanner with GPS to measure and map vast geographical features! If we're going to play our part in maintaining and improving

the forest, we need to get involved with all this measuring madness!

To begin, can you complete the 'Many Methods for Many Measures' quiz worksheet? You'll need to think long and hard about what method of measuring fits each scenario best. Can you prove yourself to be a measurement maestro!?

TASK 2: KNOW YOUR MICKEYS FROM YOUR MEGALITHIC YARDS



(MATHS OBJECTIVE - METHODS OF MEASUREMENTS / HISTORY OBJECTIVE - FIND AND RETRIEVE EVIDENCE)

Did you know that a few hundred years ago in England you could measure small objects in a unit called 'barleycorns', based on the length of grains of barley? One barleycorn was worth about 8.5 millimetres! Did you also know that a 'jiffy' and a 'smidgen' are real units of measure? A jiffy is a unit of time used to measure a computer's clock cycle (it's about 10 milliseconds), while a smidgen is worth 1/32 of a teaspoon. There's even a unit of measure called a 'Mickey', but let's see if you can figure out what that one's worth yourself!

In preparation for creating and testing your very own unit of measure, can you use the 'Know Your Sheppeys' from Your Siriometers worksheet to explore the history of some of the most interesting, unique, and downright baffling methods of measure? Have fun finding out what a Beard-second is!

TASK 3: MASTER THE MEASUREMENTS

(MATHS OBJECTIVE - MAKING MEASUREMENTS)

Let's say you're a Master Measurer, out there determining diameters and laying down lengths - when you realise you've found yourself without your trusty tape measure or your reliable rangefinder. How might you measure something without the means to do so?

Time for a little creative ingenuity - just like the creators of the units of measure in Task 2!

Can you use the 'Master the Measurements' sheet to create your own units of measure - one based on a body part and one based on a common object? Compare your methods for accuracy, precision, efficiency and repeatability. Just don't go for barley or beard hairs!



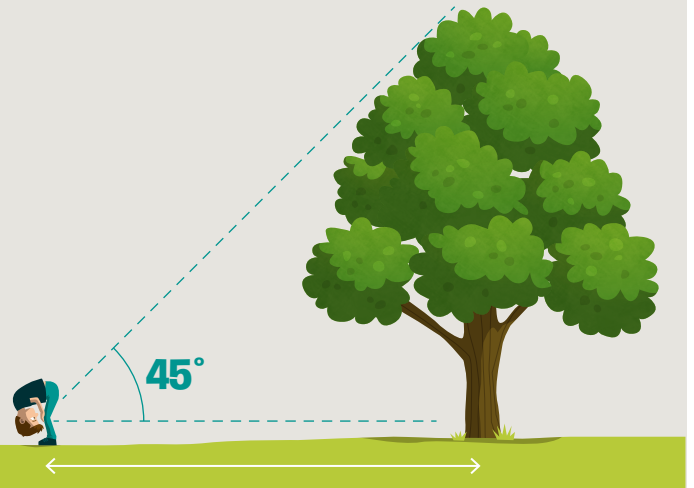
TASK 4: TAKE IT TO THE TREES

(MATHS OBJECTIVE - MAKING MEASUREMENTS / PROBLEM SOLVING / ESTIMATION)

All around the Forestry exploration poster, you'll see trees that need to be measured for a myriad of reasons. Some will be having their growth monitored. Some will be checked for signs of weakness or damage - in case they need to be removed for safety reasons. Some will have to reach a target height before they are felled for use in

manufacturing (for the production of things like paper, furniture and construction materials). Some will be measured to make sure they aren't encroaching on buildings or other structures. All in all, there are lots of reasons to measure trees - and lots of ways to do it, even without a rangefinder! Before you tackle the troublesome tree and the teetering treehouse, find a tree and have a go at this tape-free measuring method!

1. Facing away from the tree, stand with your legs apart.
2. With your legs straight, bend down and look between your legs at the tree.
3. Move towards or away from the tree so that you can just about see the top of the tree between your legs.
4. Mark the position of your feet (you could use a rock or a spare item of clothing) and measure the distance between your feet and the tree trunk (you could use one of the measuring methods you developed in Task 3). The distance between your feet and the tree trunk is about the same height as the tree.



This tape-free method works because the angle you look at from between your legs to the top of the tree is about 45 degrees. The tree makes a 90 degree angle with the ground (a right angle). This means

you've made a rough isosceles triangle, which also means that the distance between your feet and the tree trunk is about the same as the height of the tree!



TASK 5: IT'S TREEHOUSE TIME

(MATHS OBJECTIVE - SCALE / DESIGN TECHNOLOGY OBJECTIVE - DESIGN AND EVALUATE)

Well, we've measured many things in multiple ways - now it's time to put all that measuring work to good use to design a new treehouse for the forest!

You can include anything you think would be useful, fun, exciting and/or interesting in your design. For example, my tree house (pictured here) has solar panels and reused tyres for flower baskets, as well three methods of ascension (rope ladder, wooden steps and climbing holds!), and it even has a zipline for a speedy exit!

As you design your treehouse, think about the measurements and work to scale. This means choosing a measurement for your drawing that will represent the real-life measurement of the treehouse. Think about how you would represent one meter in your plans. One centimeter? The size you pick will depend on how grand your plans are! When you're done, ask an adult's help to share your efforts via email at hello@getkidsintosurvey.com for a chance to have your work showcased on the Get Kids into Survey social media channels!

TASK 1

MANY METHODS FOR MANY MEASURES

LINK THE METHOD OF MEASURING TO THE APPROPRIATE SCENARIO. ONE EXAMPLE HAS BEEN DONE FOR YOU. CAN YOU COMPLETE THE REST, ANSWER THE BONUS QUESTIONS, AND PROVE YOURSELF TO BE A MEASUREMENT MAESTRO!?



LASER SCANNER



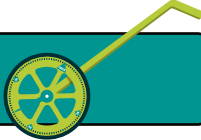
FOR ACCURATELY ESTIMATING THE LENGTH OF A SCHOOL PLAYGROUND

TAPE MEASURE



MEASURING COORDINATES ON THE EARTH'S SURFACE

TRUNDLE WHEEL



MEASURING THE HEIGHT OF A DOOR

MEASURING TAPE



TAKING MANY MEASUREMENTS QUICKLY TO MAKE A MODEL OF A ROAD THROUGH A FOREST FOR DESIGN AND CONSTRUCTION OF SAFE PARKING SPACES.

TOTAL STATION



MEASURING THE CIRCUMFERENCE OF A TREE

RTK GNSS UNIT



SCANNING A RIVERBED TO MEASURE WATER DEPTH

SONAR SCANNER



FOR MEASURING LONG DISTANCES

BONUS QUESTIONS

Why do you think it would be a bad idea to use a ruler to measure around a tree?

Why would a drone-mounted laser scanner be useful for scanning and measuring the tallest trees?

What unit of measure would you use for the distance between the capital cities of two neighbouring countries?

TASK 3

MASTER THE MEASUREMENTS



USE THIS WORKSHEET TO CREATE YOUR OWN UNITS OF MEASURE -- ONE BASED ON A BODY PART, ONE BASED ON A COMMON OBJECT, AND ONE BASED ON A NATURAL OBJECT. JUST DON'T GO FOR BARLEY OR BEARD HAIRS! COMPARE YOUR METHODS FOR ACCURACY, PRECISION, EFFICIENCY, AND REPEATABILITY.

UNIT 1

Based on a body part

YOUR UNIT NAME	BASED ON (e.g. handspan, forearm, foot)	EQUIVALENT TRADITIONAL LENGTH	OBJECT MEASURED	OBJECT LENGTH	OBJECT LENGTH (TRADITIONAL MEASURE)	WAS IT ACCURATE?	HOW PRECISE COULD YOU BE?	HOW EFFICIENT WAS IT?	CAN YOU USE IT ELSEWHERE?

UNIT 2

Based on a common object

YOUR UNIT NAME	BASED ON (e.g. handspan, forearm, foot)	EQUIVALENT TRADITIONAL LENGTH	OBJECT MEASURED	OBJECT LENGTH	OBJECT LENGTH (TRADITIONAL MEASURE)	WAS IT ACCURATE?	HOW PRECISE COULD YOU BE?	HOW EFFICIENT WAS IT?	CAN YOU USE IT ELSEWHERE?

UNIT 3

Based on a natural object

YOUR UNIT NAME	BASED ON (e.g. handspan, forearm, foot)	EQUIVALENT TRADITIONAL LENGTH	OBJECT MEASURED	OBJECT LENGTH	OBJECT LENGTH (TRADITIONAL MEASURE)	WAS IT ACCURATE?	HOW PRECISE COULD YOU BE?	HOW EFFICIENT WAS IT?	CAN YOU USE IT ELSEWHERE?



TASK 2

KNOW YOUR SHEPPEYS FROM YOUR SIRIOMETERS

USE THIS WORKSHEET TO EXPLORE THE HISTORY OF SOME OF THE MOST INTERESTING, UNIQUE, AND DOWNRIGHT BAFFLING METHODS OF MEASURE! COMPLETE THE FACT FILE FOR EACH OF THE UNITS OF MEASURE.



What is an
ALTUVE?

LENGTH:

ORIGINS:

USED TO MEASURE:

What is a
BEARD-SECOND?

LENGTH:

ORIGINS:

USED TO MEASURE:

What is a
**MEGALITHIC
YARD?**

LENGTH:

ORIGINS:

USED TO MEASURE:

What is a
SHEPPY?

LENGTH:

ORIGINS:

USED TO MEASURE:

What is a
SIRIOMETER?

LENGTH:

ORIGINS:

USED TO MEASURE:

