Hands On Learning
with Reading Museum Service

MEASUREMENT S2/A



How often do you find out your height or weight? In the box are lots of different objects used for measuring. Measuring size, weight or pressure is important to individuals, scientists and companies.



Above: Scientists measuring a giant clam.

Above: A fisherman measuring his catch.

Crab gauge

Crab fishing is popular in the United States of America. This gauge measures the size of caught crabs.





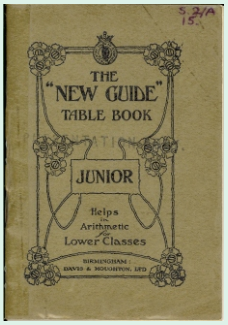
The markings on the ruler are very important. The 'Calif-Wash' tells us that this ruler is used by fishermen in the west of the country. This is where the states of California, Oregon and Washington are. Fishers in Oregon can only legally catch crabs that are bigger than 5 ¾ inches (14.6 cm). In Washington it is 6 inches (15.2 cm). The sketches show the difference between male and female crabs. It is illegal to catch female crabs.

The tight restriction on the size and sex ensure the crab can reproduce and maintain their number. This is called sustainable exploitation and stops them becoming extinct.



Booklet

Measurements can be given in either imperial or metric forms. This booklet shows how to change imperial measurements into metric. In Britain, distance is measured in miles but in many other countries it is kilometres.



Reading Borough Council
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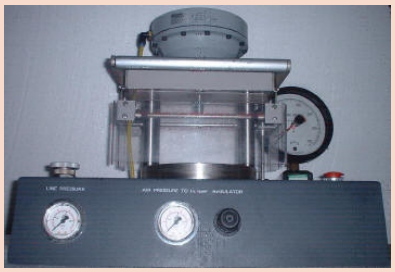
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Pressure gauge



This particular gauge is called a Bourdon. It measured the pressure required to burst objects. It would have been attached to a coiled tube. When the pressure increased the tube began to uncoil. This turned the needle and gave a reading of the amount of pressure.



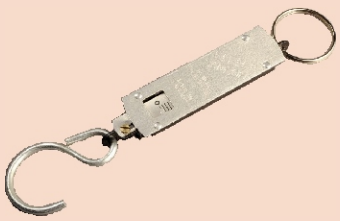
Many companies test products to ensure they are safe before being sold. It would be used on products made of material such as rubber where resisting high pressure is required.

Barometer



A barometer measures atmospheric pressure. It predicts whether the weather will be dry or wet. High pressure means the weather is likely to be dryer but when it is lower then it is wetter. The barometer became common in richer homes as interest in weather forecasting and scientific knowledge increased during the nineteenth century. Weather forecasters now use a more sophisticated device to do the same job.

Spring balance



Hold the balance by the keyring. An object can be hung on the hook and it will measure the force in Newtons. Larger versions are used to weigh heavy loads such as trucks.

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External callipers



A calliper measures the diameter of circular objects. The tips are placed at either end. When the calliper is removed the distance between the tips is measured. The example on the left is from the army. They used to measure the size of cannonballs with callipers. This ensured they would fit in the cannon. These callipers have two arms that are hinged so that they slide freely over each other. This allows the steel tips to point either inwards to indicate the diameters of the cannonball, or outwards to measure the size of the cannon mouth, known as the bore.



Vernier callipers



This calliper has different ways of measuring. The small sharp points find internal dimensions. The thin points give a more accurate reading than the larger jaws. What would you measure with this?

The longer jaws measure the outer dimensions of objects. These are called the lower jaws. Here the straight edge is on the inside of the clamp. On the smaller jaws it was on the outside. A straight edge is needed to get an accurate measurement. The object is locked between the jaws and the measurement can be read that way.

Tape measure



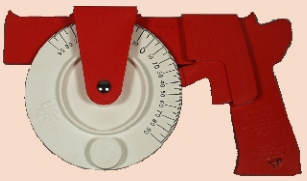
Do you like making things? Joiners and carpenters use measuring tapes to find out the length of a piece of material or the size of a gap. The tape is stored, rolled in the box and is easy to pull out and use. A clip on the back lets it be worn on trousers.



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Clinometer



This strange looking item measures angles. It is shaped a bit like a gun. Pointing the tip of the barrel's nose at an object and holding down the trigger lets the wheel move. When the wheel has stopped the person lets go of the trigger. The wheel then stays in place. An arrow points to an angle on the wheel. This is the measurement of the angle between the person and the object.



Hat gauge



How would you get the right size hat for a special occasion? This gauge measures hat size. The metal band is placed around the inside of the hat. Where the inner band finishes there is a number. This is the hat size. It is like having a shoe size.

Hand gauge

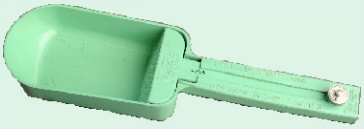


This device is for measuring the size of a person's hand. Place the index finger against the left wedge when it is raised. Then move the raised right wedge to meet the side of the palm. After you remove your hand it leaves a measurement. There are different size scales for children, women and men. All are marked on the gauge. With the hand measured a person could then buy the best fitting gloves. Now most gloves come in small, medium or large size.

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Food measure



The scoop has been used by shopkeepers to roughly measure out food quantities. Customer would come in and ask for a the amount of raisins or sugar they wanted. The shopkeeper adjusted the scoop by unscrewing the metal piece. Then they would just dip the scoop into a large container to fill it and put the goods into a bag. It made the process of measuring out the amounts quicker.

Can you imagine any problems with using a scoop to measure out the food?

Weights



Have you ever used scales at home? This selection of weights might have been used by a shopkeeper to measure the amount of sugar given to a customer. Before the modern scales that we have now, most weighing was done on a scale that balanced two sides. If someone wanted 7 ounces (198 grams) of sugar, all the weights would have been put on one side of the scale and the sugar added to the other side until they balanced. When they balanced, the shopkeeper would know there was 7 ounces of sugar.

The markings on the weights show that a company called Crane from Wolverhampton made them.

Pocket balance



Have you ever seen fishermen weighing their catch? They might use an instrument like this. It is a self-indicating pendulum lever scale. It has a small weight attached to the bottom as a counterbalance. This is called the poise, which is a mass of metal that is used on the unequal-armed instrument to assist in the determination of the total weight of the load. The object to be weighed is attached to the clip. Once the object is in position, the counterbalance swings upwards to balance the load and an indicator points to the scale, giving the weight in units of grams.