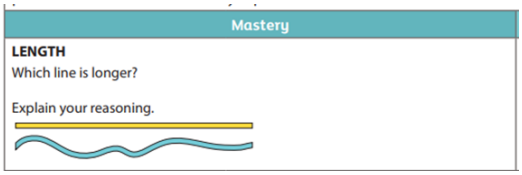
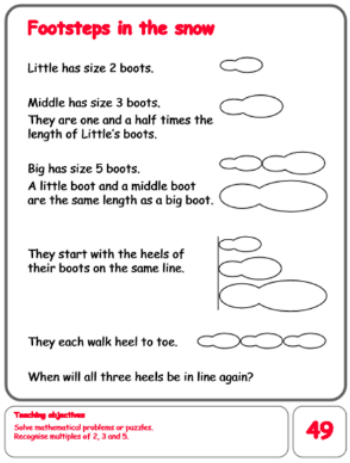
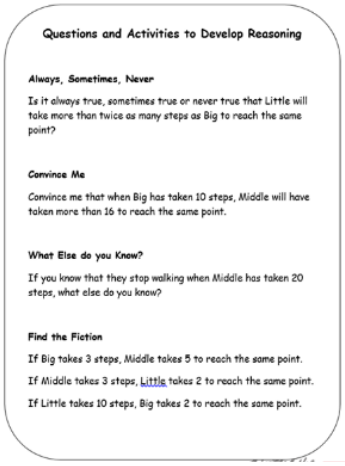
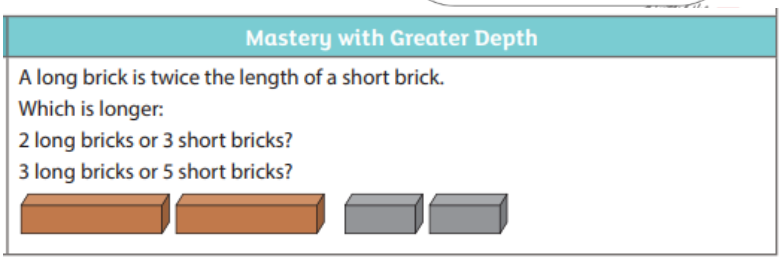
Planning Overview
Year 1 Measures (length, capacity, weight)
Money is a separate plan; Time is a separate plan.

Compare, describe and solve practical problems for: lengths and heights [for example, long/short, longer/shorter, tall/short, double/half]
Compare, describe and solve practical problems for: mass/weight [for example, heavy/light, heavier than, lighter than]
Compare, describe and solve practical problems for: capacity and volume [for example, full/empty, more than, less than, half, half full, quarter]
Measure and begin to record the following: lengths and heights, mass/weight, capacity and volume, time (hours, minutes, seconds)

	Teaching and Learning
Solve practical problems using direct comparison of lengths, heights and widths	***Comparing 2 objects*** Length boxes (longer/shorter than) containing pairs of objects to compare e.g. ribbons, pencils, rods, keys, string, wool, toothbrush, feather. Make sure line up to a common starting point to compare directly. Similar boxes for width (wider/narrower than) and height (taller/shorter than). ***Comparing a set of objects against 1 given object*** Hunt things that are longer, shorter, taller, wider than a given object and put into 2 sets. ***Ordering several objects*** Cuisenaire rods longest to shortest Organising a group/whole class into height order shortest to tallest Go outside and find sticks and order them from fattest to thinnest Order the ribbons from widest to narrowest. Mark heights on the wall with names – who's tallest, shortest etc Choose items from the classroom and make a measuring chain e.g. I have a bottle of water, can you find me something that is shorter? Wrapping parcels- is this piece of paper long enough? Wide enough? How can we check?  Choose fluency questions to reinforce the vocab and the idea that length is measured lying down and height is measured standing up.

Solve practical problems using non-standard units to measure lengths, heights and widths	Use straws, cubes, paperclips, handspans or footsteps to measure length height or width. Remember to place objects end to end with no gaps and in a straight line. How many cubes fit between the 2 pencil pots? How many paper clips fit along the maze? How far can you squirt water? Measure with footprints. What's not fair? Different size footprints from different children. Can you find something that's fairer? How far does 10 steps take you? Is it the same as your partner? Why? Make flowers that reach the children's heights – measure using hand spans (like measuring a horse's height). Make a measuring rod out of 10 cubes. Use it to measure given objects. Reasoning and problem solving  **Footsteps in the snow** Little has size 2 boots. Middle has size 3 boots. They are one and a half times the length of Little's boots. Big has size 5 boots. A little boot and a middle boot are the same length as a big boot. They start with the heels of their boots on the same line. They each walk heel to toe. When will all three heels be in line again? Teaching objectives Solve mathematical problems or puzzles. Recognise multiples of 2, 3 and 5. 49  **Questions and Activities to Develop Reasoning** **Always, Sometimes, Never** Is it always true, sometimes true or never true that Little will take more than twice as many steps as Big to reach the same point? **Convince Me** Convince me that when Big has taken 10 steps, Middle will have taken more than 16 to reach the same point. **What Else do you Know?** If you know that they stop walking when Middle has taken 20 steps, what else do you know? **Find the Fiction** If Big takes 3 steps, Middle takes 5 to reach the same point. If Middle takes 3 steps, Little takes 2 to reach the same point. If Little takes 10 steps, Big takes 2 to reach the same point.  **Mastery with Greater Depth** A long brick is twice the length of a short brick. Which is longer: 2 long bricks or 3 short bricks? 3 long bricks or 5 short bricks?
Measure and begin to record lengths and heights using standard units (cm & m) and use to solve practical problems	Use the measuring rod to make a paper ruler marked with lines. Use the paper ruler to measure various objects. Replace with a standard ruler and talk about the differences. Show clearly how to use a ruler. Always start at zero. Measure items around the classroom. Make a playdough worm – longer than 10cm and shorter than 15cm.

	Make and measure items in DT or Art linked to current topic e.g. rockets, cars, pictures of flowers or animals. Estimate and measure in science and PE e.g. how far a car will roll down a ramp, how far will a balloon with a straw on move along a string, how far can you throw a beanbag? NRICH – Little man The Man is much smaller than you and me. Here is a picture of him standing next to a mug.  Can you estimate how tall he is? Can you think of something that you have at school or home that is approximately twice as tall as the Man? What about something that is about half as tall as the Man? How tall do you think the Man's mug might be? Can you estimate how many "Man mugs" of tea might fill one of our mugs? Investigate a real-life problem e.g. using real peas in a pod – do the longest pods have the most peas? Measure and record in cm then count the peas inside. Collect everyone's results together.
Solve practical problems using direct comparison of capacity and volume	Practical investigation of different sized and shaped containers in the water tray. Rice and sand would also be suitable. Include shallow wide and tall narrow containers. ***Comparing 2 objects*** Direct comparison of 2 containers. Which container holds more? How do you know? 2 methods - fill one and pour it into the other. Or fill both and pour into identical measuring jugs to compare capacity directly. Use vocabulary full, empty, half-full, half-empty. Why is the water not as tall in this container if they have the same capacity? ***Comparing a set of objects against 1 given object*** *F*ind containers that hold more/less/the same as the jug. Could estimate first. Use new vocabulary e.g. which containers do you think will have a greater capacity than the jug? Have a smaller capacity? Have the same capacity? How could you find out? Pour water into the jug to check that you are correct. *Ordering a set of containers* Follow on from activity above by trying to put 3 or 4 containers in order

NRICH – compare the cups

Which might you choose if you wanted a lot to drink? Why?
Which one would you choose if you did not want a lot to drink? Why?
Could you arrange the cups in a line from the one that holds the most liquid to the one that holds the least liquid?
How will you test whether you are right?

NRICH – Thirsty – ordering pictures of full, empty, half empty, tall and short glasses (2 levels yellow (easier) and orange GD)

This problem has been designed to work on in a group of about four. For more details about how you might go about doing this, please read the Teachers' Notes.

You will need to print off these eight cards, which have pictures of glasses of orange and blackcurrant juice on them. You need one set of these cards for your group.

Have a good look at the cards with everyone in your group. Talk to each other about what you notice. Can you sort the cards in different ways?

Now you are ready for the challenge. You will need to print off this set of clue cards. There are ten clue cards altogether.

Give the clue cards out to everyone in your group. Take it in turns to read your cards out loud. Listen out for instructions that tell you what to do, which are written on one or more of the cards.

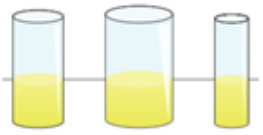
Can you lay out the pictures of the drinks in the way described by the clue cards?

Mastery

CAPACITY

Captain Conjecture says, 'All of the glasses contain the same quantity of lemonade.'

Do you agree?



Explain your reasoning.

Mastery

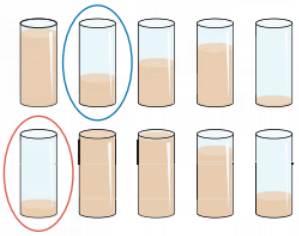
Sid has a full bottle of drink. He pours it into a jug.

Which has the greater capacity, the bottle or the jug?

Mastery with Greater Depth

Point to a glass which is about half as full as the glass in the red oval?

Can you point to a glass which is about twice as full as the glass in the blue oval?



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<tr>
<td>Solve practical problems using non-standard units to measure capacity and volume</td>
<td>Choose a container e.g. a cup as your non-standard unit.
How many cups do you estimate you could fit in this bowl?
How could you check?
Can you fit more or fewer cups in this jug?

Digging Deeper – Capacity problem

SETTING THE SCENE
Give the children a jug of water and two sizes of cups/containers, one which will hold half the volume of the jug (the blue cup) and one which will hold a quarter of the volume of the jug (the yellow cup).

Explain to the children that the jug contains 'juice' for a party. Ask them to investigate how many blue cups they could fill from one jug. Then repeat with the yellow cups. Start to record this in a simple table.

<table>
<tr><td> 
Jugs</td><td>1</td><td></td><td></td><td></td><td></td></tr>
<tr><td> 
Blue cups</td><td>2</td><td></td><td></td><td></td><td></td></tr>
<tr><td> 
Yellow cups</td><td>4</td><td></td><td></td><td></td><td></td></tr>
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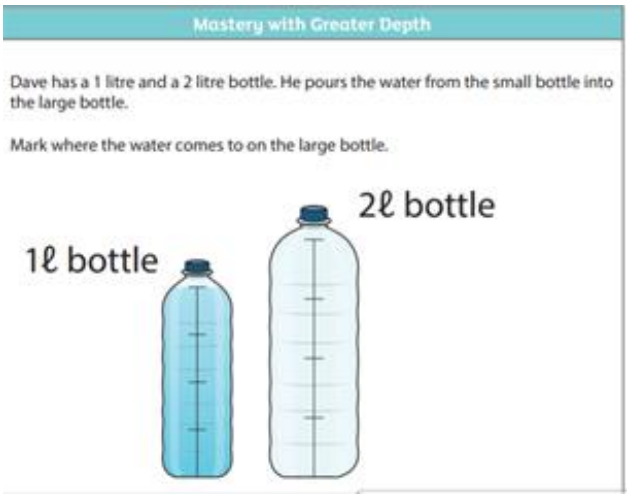
<tr>
<td>Measure and begin to record capacity and volume using standard units (litres) and use to solve practical problems</td>
<td>Children to look at a selection of bottles with labels on. Can they find any with 1l or 2l written on?

Show children the marks on a measuring jug or tube with 1 litre at the top.

Investigate pouring 1 litre of water from a jug into different bottles to find one that holds 1 litre/2litres.

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Solve practical problems using direct comparison of weight/mass	Practical investigation of different sized and shaped objects to weigh. Include big light objects and small heavy objects. ***Comparing 2 objects directly*** Give children objects to directly compare the weight of. Encourage them to be a human balance, comparing the objects in their outstretched hands. Introduce a bucket balance. You could make a balance to weigh larger objects using a coat hanger on a hook. Which is heavier? How do you know? What will happen if I put this in here? ***Comparing a set of objects against 1 given object*** Have a set of objects for the children to weigh. Find objects that are heavier/lighter than a given object e.g. a toy dinosaur ***Ordering objects by weight*** Trying to compare more than 2 objects can be tricky with a balance. It could be helpful to introduce a set of spring scales. These can be made quite easily with recycled milk or juice cartons and long elastic bands. Ideas around this can be found on NRICH at https://nrich.maths.org/13361 In the resources section at the bottom there is a link to a video that explains the value of these as a resource and shows exactly how to make them. Using a set of 3 identical spring scales taped onto a board, it is easy to directly compare the mass of 3 items. You could then go onto comparisons using a single spring scale and marking how far down each item stretches the basket. Predictions can then be made using a different colour pen before testing. Can they order objects by weight? Make sure this is different to the order if you ordered them by size. E.g. wrap up boxes with weights inside or wrap up different balls e.g. inflatable, boule, football, bouncy ball so biggest is not the heaviest. Challenge some children to order objects using a balance instead but note that ordering 4 objects with a similar mass using a balance is working at a GD level in Year 1 (see question below). I am thinking of an object that is heavier than a tennis ball but lighter than this book. What could it be?

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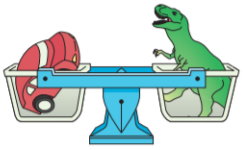
Mastery
MASS
Here are three items.
Can you sort them from lightest to heaviest by feeling them with your hands?

Give pupils three items that are quite different in mass.

Which is heavier, a toy car or a toy dinosaur?


Which toy is heavier?


If you added a toy car to the teddy, what would happen to the scales?

Explain your reasoning.

Mastery with Greater Depth
Here are four items.
Can you sort them from lightest to heaviest using these balance scales?

Give pupils four items that are quite similar in mass.
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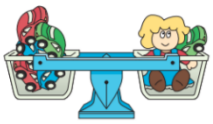
<tr>
<td>Solve practical problems using non-standard units to measure weight/mass</td>
<td>
Introduce concept of weighing objects against non-standard units such as multilink cubes. Can you make the scales balance?

This allows us to see how much heavier something is e.g. if it is twice as heavy. If the car weighs 3 cubes, how much would 2 cars weigh? Prove it.
Record weights in cubes for different objects and use this to order them.

Mastery with Greater Depth
Look at these balance scales. There are five cars on one side. The doll weighs the same as how many cars?


Which of these statements is true?
■ The dinosaur is lighter than the robot.
■ The robot is lighter than the dinosaur.
■ The dinosaur and robot weigh the same.


Explain your reasoning.
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Measure and begin to record weight/mass using standard units (kg) and use to solve practical problems	Introduce 1kg weight and pass it around. Is there anything heavier than 1kg in the classroom? Children to record/sort objects that are more and less than a kilogram. Let children weigh themselves and see how many kilograms they weigh.