

Reasoning and Problem Solving

Step 7: Compare Capacities

National Curriculum Objectives:

Mathematics Year 3: (3M9d) [Measure, compare, add and subtract: lengths \(m/cm/mm\); mass \(kg/g\); volume/capacity \(l/ml\)](#)

Differentiation:

Questions 1, 4 and 7 (Problem Solving)

Developing Use given limitations to share a given volume (of up to 20ml) between 3 containers.

Expected Use given limitations (involving $<$, $>$ and $=$) to share a given volume (of up to 50ml or 50L) between 3 containers.

Greater Depth Use given limitations (involving $<$, $>$ and $=$) to share a given volume (of up to 60ml or 60L) between 3 containers.

Questions 2, 5 and 8 (Reasoning)

Developing Explain if a child has made an error in describing exchanging amounts of liquid between containers of differing capacities. Questions are limited to understanding capacity of multiples of 10.

Expected Explain if a child has made an error in describing exchanging amounts of liquid between containers of differing capacities. Knowledge of multiples of 5 and 10 required.

Greater Depth Explain if a child has made an error in describing exchanging amounts of liquid between containers of differing capacities. Knowledge of multiples of 4, 5 and 10 required.

Questions 3, 6 and 9 (Reasoning)

Developing Explain a misconception regarding the capacity of different containers. Scales with increments of 1 or 10 units.

Expected Explain a misconception regarding the capacity of different containers. Scales with increments using multiples of 10 or 100 units.

Greater Depth Explain a misconception regarding the capacity of different containers. Scales' increments will vary, including some fractions or all as one measure, e.g. 2,500ml.

More [Year 3 Mass and Capacity](#) resources.

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Compare Capacities

1a. You have 20ml to share between the containers below.

This one must hold 8ml.

Container B must hold more than container C.



A



B



C

What volume of liquid could you place in each?



PS

Compare Capacities

1b. You have 20ml to share between the containers below.

Container A must hold less than container B

This one must hold 6ml.



A



B



C

What volume of liquid could you place in each?



PS

2a. Dan has two cups. Cup A holds 20ml and cup B holds 10 times this amount. He says,



Cup B holds less than cup A.

Is Dan correct? Explain your answer.



R

2b. Finn has two vases. Vase A holds 50ml and vase B holds double this amount. He says,



Vase B holds more than vase A.

Is Finn correct? Explain your answer.

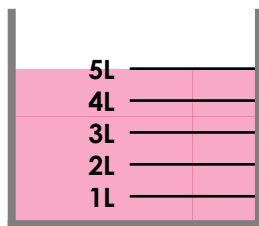
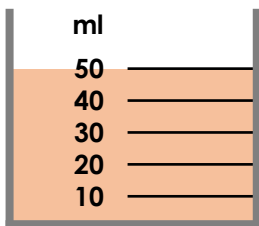


R

3a. Talia thinks that container A has a larger capacity than container B because 50 has a bigger value than 5.

A

B



Is she correct? Explain why.

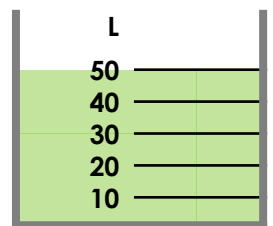
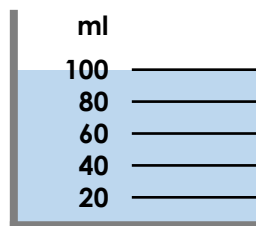


R

3b. Lydia thinks that container B has a smaller capacity than container A because 50 has a smaller value than 100.

A

B



Is she correct? Explain why.



R

Compare Capacities

Compare Capacities

4a. You have 12ml to share between the containers below.



A

B

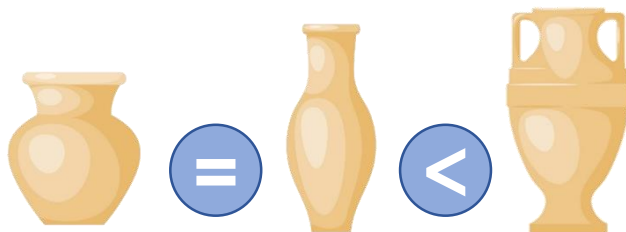
C

All containers have at least 1ml and no fractions. What volume of liquid could you place in each?



PS

4b. You have 48L to share between the containers below.



A

B

C

All containers hold multiples of 4. What volume of liquid could you place in each?



PS

5a. A cup holds half the amount of liquid held by a 500ml bottle. Rachel says,



The cup holds 300ml

Is Rachel correct? Explain your answer.



R

5b. A 200ml spray bottle holds five times the amount of liquid held by a jar. Sara says,



The jar holds 60ml.

Is Sara correct? Explain your answer.

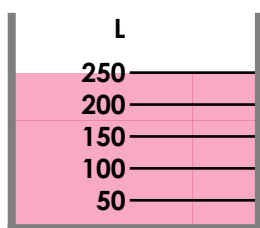
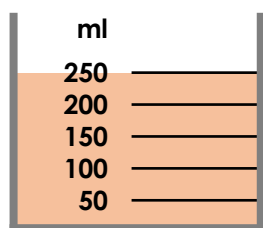


R

6a. Henryk thinks that container A and container B have the same capacity because the scales are the same.

A

B



Is he correct? Explain why.

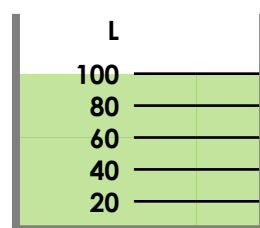
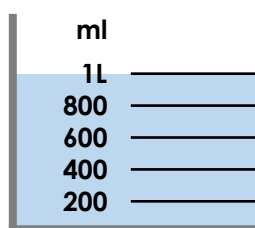


R

6b. Deena thinks that container B has a larger capacity than container A because 100 has a bigger value than 1.

A

B



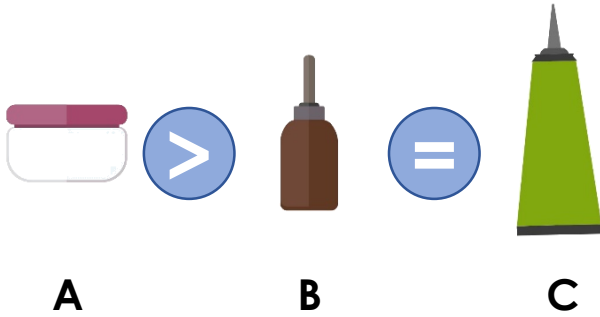
Is she correct? Explain why.



R

Compare Capacities

7a. You have 56ml to share between the containers below.



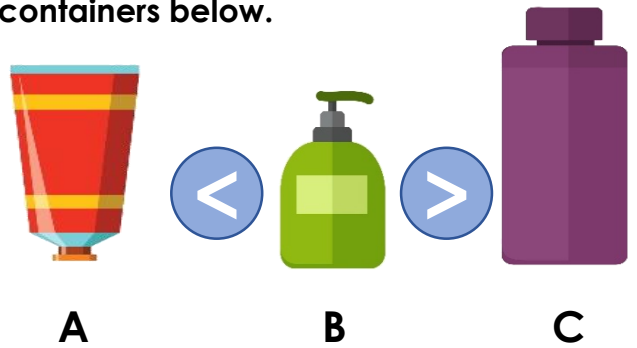
The minimum any container holds is 15ml. What volume of liquid could you place in each?



PS

Compare Capacities

7b. You have 15ml to share between the containers below.



The minimum any container holds is 3ml. What volume of liquid could you place in each?



PS

8a. Max is filling two paddling pools. He knows that paddling pool A takes 16L of water which is double what paddling pool B can hold. He says,



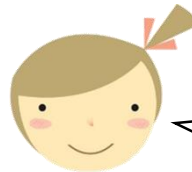
Paddling pool B holds 10L of water.

Is Max correct? Explain your answer.



R

8b. Iskra's mum has bought a refill pack of scented oils. The pack holds 800ml of oil and they have 4 oil infusers in the house. She says,



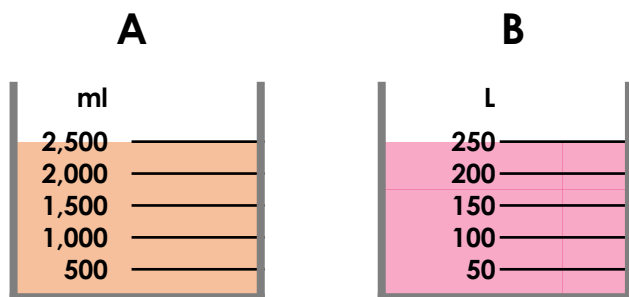
I'll be able to pour 150ml in each and have no spare oil.

Is Iskra correct? Explain your answer.



R

9a. Rudy thinks that container A has a larger capacity than container B because 2,500 has a bigger value than 250.

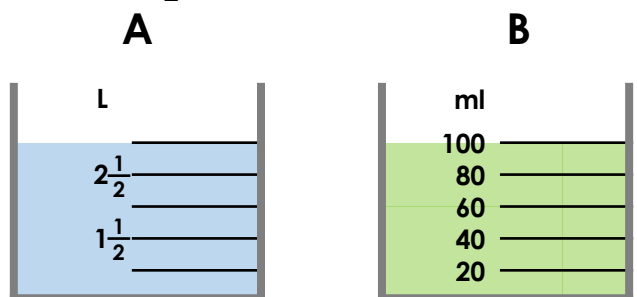


Is he correct? Explain why.



R

9b. Maliha thinks that container A has a smaller capacity than container B because $2\frac{1}{2}$ has a smaller value than 100.



Is she correct? Explain why.



R

Reasoning and Problem Solving Compare Capacities

Developing

- 1a. Various answers, for example: A – 8ml; B – 7ml; C – 5ml
- 2a. Dan is incorrect because 100ml is less than ten times 20ml. Cup B holds 200ml which is more than cup A.
- 3a. Talia is incorrect because container A is measured in ml and container B is measured in L.

Expected

- 4a. Various answers, for example: A – 2ml; B – 4ml; C – 6ml
- 5a. Rachel is incorrect because 300ml is more than half of 500ml. The cup holds 250ml.
- 6a. Henryk is incorrect because container A is measured in ml and container B is measured in L.

Greater Depth

- 7a. Various answers, for example: A – 26ml; B and C – 15ml
- 8a. Max is incorrect because 10L is more than half of 16L, which is 8L.
- 9a. Rudy is incorrect because container A is measured in ml and container B is measured in L.

Reasoning and Problem Solving Compare Capacities

Developing

- 1b. Various answers, for example: A – 4ml; B – 10ml; C – 6ml
- 2b. Finn is correct because double 50ml is 100ml.
- 3b. Lydia is incorrect because container B is measured in L and container A is measured in ml.

Expected

- 4b. Various answers, for example: A – 12L; B – 12L; C – 24L
- 5b. Sara is incorrect because if the 200ml spray holds 5 times the jar, the jar should be 40ml.
- 6b. Deena is correct because container A is measured in ml and container B is measured in L.

Greater Depth

- 7b. Various answers, for example: A – 3ml; B – 9ml; C – 3ml
- 8b. Iskra is incorrect. With 800ml of oil she will be able to fill the 4 infusers with 200ml and have no oil spare.
- 9b. Maliha is incorrect because container A is measured in L and container B is measured in ml.