

P10

Ride at the Fair

Lucy had a ride at the Fair. Her Mum asked her to pay towards it but she paid less than 20p.



Lucy paid exactly 3 coins towards the cost of the ride.



Find as many ways to do it as you can.

Objectives

- Recognise simple patterns or relationships
- Generalise and predict
- Suggest extensions by asking 'what if...?' or 'what could I try next?'
- Organise the recording of possibilities eg in an ordered list or table
- Have a system for finding the possibilities eg start with the smallest number, know when all possibilities are found, check for repeats of possibilities

Answer to P10 Ride at the Fair

The amounts up to 20p that **cannot** be made from exactly three coins are:

1p, 2p, 10p, 18p, 19p.

Lucy could have given her Mum the following amounts:

$$3p = 1p + 1p + 1p$$

$$4p = 2p + 1p + 1p$$

$$5p = 2p + 2p + 1p$$

$$6p = 2p + 2p + 2p$$

$$7p = 5p + 1p + 1p$$

$$8p = 5p + 2p + 1p$$

$$9p = 5p + 2p + 2p$$

$$11p = 5p + 5p + 1p$$

$$12p = 5p + 5p + 2p$$

$$13p = 10p + 2p + 1p$$

$$14p = 10p + 2p + 2p$$

$$15p = 5p + 5p + 5p$$

$$16p = 10p + 5p + 1p$$

$$17p = 10p + 5p + 2p$$

Notes

This is quite a challenging problem as it has a lot of possible solutions for children to identify. It is probably best tackled using real or plastic coins for pupils to manipulate. It is unlikely that pupils will find all the possible answers but they should be encouraged to develop a step-by-step approach if possible.

Pupils should spot that they don't need 20p or 50p coins as no total is above 20p.

P77 Ride at the Fair + is an extension to this problem involving using four coins instead of three.

A (much) simpler version of the problem using two coins is provided on the next page.

P10e

Ride at the Fair

Lucy had a ride at the Fair. Her Mum asked her to pay towards it but she paid less than 20p.



Lucy paid exactly 2 coins towards the cost of the ride.



Find as many ways to do it as you can.

Objectives

- Recognise simple patterns or relationships
- Generalise and predict
- Suggest extensions by asking 'what if...?' or 'what could I try next?'
- Organise the recording of possibilities eg in an ordered list or table
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Answer to P10e Ride at the Fair

The amounts up to 20p that **cannot** be made from exactly two coins are:

1p, 5p, 8p, 9p, 13p, 14p, 16p, 17p, 18p and 19p

Lucy could have given her Mum the following amounts:

$$2p = 1p + 1p$$

$$3p = 2p + 1p$$

$$4p = 2p + 2p$$

$$6p = 5p + 1p$$

$$7p = 5p + 2p$$

$$10p = 5p + 5p$$

$$11p = 10p + 1p$$

$$12p = 10p + 2p$$

$$15p = 10p + 5p$$

Notes

This is much less challenging problem than P10 as it has fewer possible solutions for children to identify. It is probably best tackled using real or plastic coins for pupils to manipulate. It is unlikely that pupils will find all the possible answers but they should be encouraged to develop a step-by-step approach if possible.

Pupils should spot that they don't need 20p or 50p coins as no total is above 20p.

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P10

Ride at the Fair

Lucy had a ride at the Fair. Her Mum asked her to pay towards it but she paid less than 20 cents.



Lucy paid exactly 3 coins towards the cost of the ride.



Find as many ways to do it as you can.

Objectives

- Recognise simple patterns or relationships
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- Suggest extensions by asking 'what if...?' or 'what could I try next?'
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Answer to P10 Ride at the Fair

The amounts up to 20 cents that **cannot** be made from exactly three coins are:

1c, 2c, 10c, 18c, 19c.

Lucy could have given her Mum the following amounts:

$$3c = 1c + 1c + 1c$$

$$4c = 2c + 1c + 1c$$

$$5c = 2c + 2c + 1c$$

$$6c = 2c + 2c + 2c$$

$$7c = 5c + 1c + 1c$$

$$8c = 5c + 2c + 1c$$

$$9c = 5c + 2c + 2c$$

$$11c = 5c + 5c + 1c$$

$$12c = 5c + 5c + 2c$$

$$13c = 10c + 2c + 1c$$

$$14c = 10c + 2c + 2c$$

$$15c = 5c + 5c + 5c$$

$$16c = 10c + 5c + 1c$$

$$17c = 10c + 5c + 2c$$

Notes

This is quite a challenging problem as it has a lot of possible solutions for children to identify. It is probably best tackled using real or plastic coins for pupils to manipulate. It is unlikely that pupils will find all the possible answers but they should be encouraged to develop a step-by-step approach if possible.

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Answer to P10e Ride at the Fair

The amounts up to 20 cents that **cannot** be made from exactly two coins are:

1c, 5c, 8c, 9c, 13c, 14c, 16c, 17c, 18c and 19c

Lucy could have given her Mum the following amounts:

$$2c = 1c + 1c$$

$$3c = 2c + 1c$$

$$4c = 2c + 2c$$

$$6c = 5c + 1c$$

$$7c = 5c + 2c$$

$$10c = 5c + 5c$$

$$11c = 10c + 1c$$

$$12c = 10c + 2c$$

$$15c = 10c + 5c$$

Notes

This is much less challenging problem than P10 as it has fewer possible solutions for children to identify. It is probably best tackled using real or plastic coins for pupils to manipulate. It is unlikely that pupils will find all the possible answers but they should be encouraged to develop a step-by-step approach if possible.

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