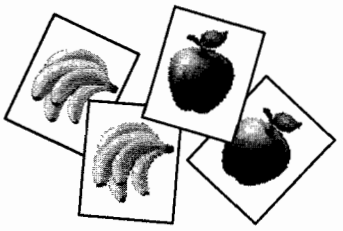
Memory game

T1

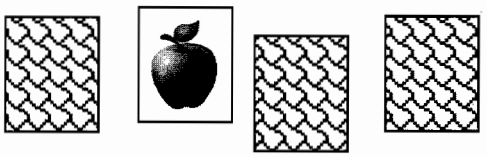
This problem gives you the chance to:
- work out probabilities

Ella is teaching her little brother Sammy to play a memory game.



1. She starts with four cards, two have a picture of an apple on them and two have a picture of bananas.

   The cards are laid on the table with the pictures hidden, and then mixed up.
   Ella says 'you can turn over two cards and you win if they are the same'.

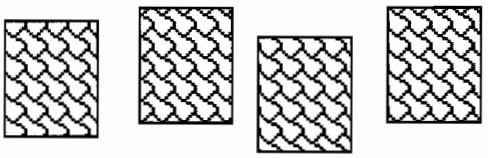


   Sammy turns over one card. It has an apple on it. Then he turns over another card.
   What is the probability that the second card has an apple on it? 1/3 ✓ 1
   Explain how you figured it out.

   ~~ap.~~ ban ap. ban

   so 2 ban left and 1 ap so that is 1/3 ✓ 1

2. Sammy did not get two cards the same. Ella turns the cards back over so that the pictures do not show, but she did not mix up the cards.

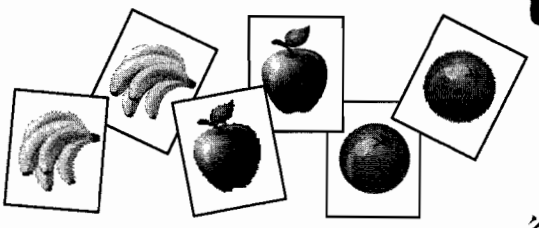


   Sammy is good at remembering where things are.
   He turns over one card and then another.
   How should he choose the first card to turn over so that he can be sure to win? ✓

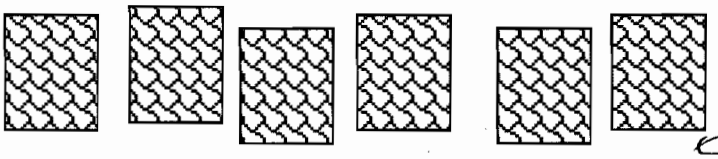
   he should pick one that has not been chosen yet and anthen find the match. 1

T1

3. Ella adds two cards with pictures of an orange, making six cards all together.



She lays all the cards down with the pictures hidden and mixes them up.



5×6=30

Sammy turns over one card and then another.

What is the probability that they are both the same? Explain how you figured it out.

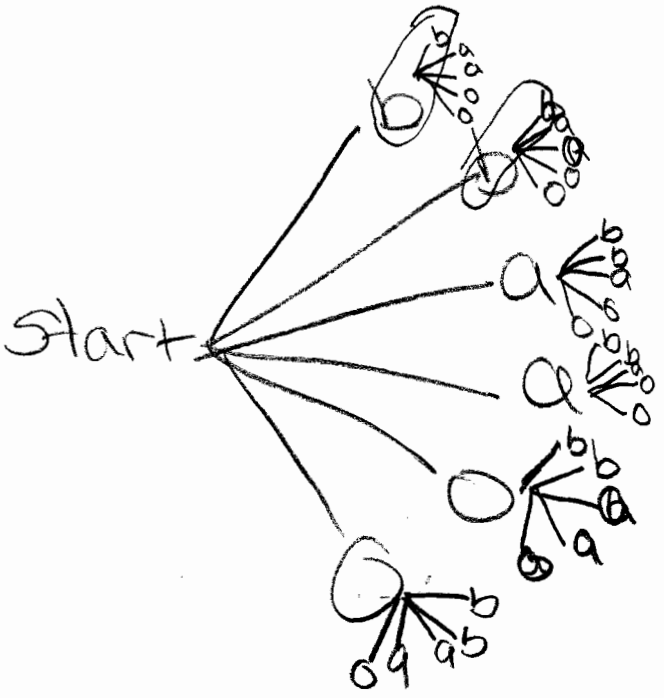
3/30 ✗ 0

2

4. What is the probability that they both have pictures of a banana? Show how you worked it out.

2/30 ✓ 1

2/30



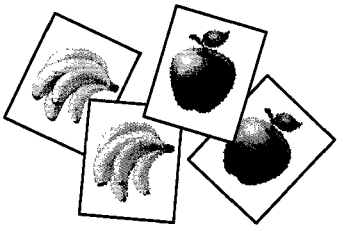
✓ 1

Memory game

This problem gives you the chance to:
• work out probabilities

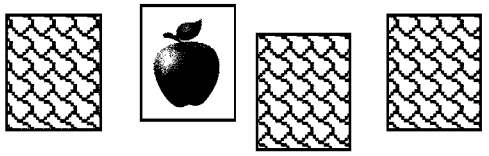
T2

Ella is teaching her little brother Sammy to play a memory game.



1. She starts with four cards, two have a picture of an apple on them and two have a picture of bananas.

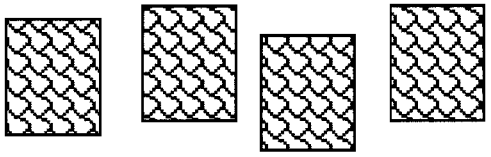
   The cards are laid on the table with the pictures hidden, and then mixed up.
   Ella says 'you can turn over two cards and you win if they are the same'.



   Sammy turns over one card. It has an apple on it. Then he turns over another card.
   What is the probability that the second card has an apple on it? 33% ✓ 1
   Explain how you figured it out.

I figured it out by having the three cards ✓ left equal 100% and only one was an apple so I divided 100 by 3 to get 1/3. 1

2. Sammy did not get two cards the same. Ella turns the cards back over so that the pictures do not show, but she did not mix up the cards.

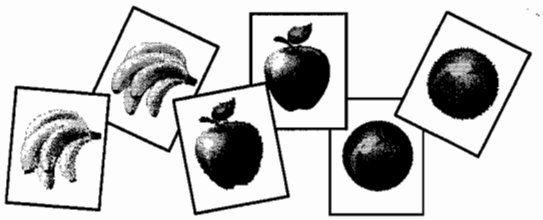


   Sammy is good at remembering where things are.
   He turns over one card and then another.
   How should he choose the first card to turn over so that he can be sure to win? ✓

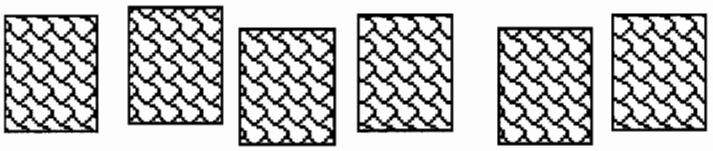
He chooses a different card this time so that if its an apple he knows where the other one is. 1

T2

3. Ella adds two cards with pictures of an orange, making six cards all together.



She lays all the cards down with the pictures hidden and mixes them up.



Sammy turns over one card and then another.

What is the probability that they are both the same? Explain how you figured it out.

20% ✓ 1

Now there are five left to match the first one so I did 100 divided by 5 to get 20% ✓ 2

4. What is the probability that they both have pictures of a banana? Show how you worked it out.

20% × 0

This is the same as last time

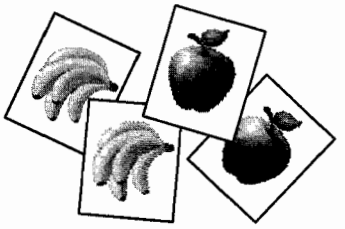
0

Memory game

This problem gives you the chance to:
- work out probabilities

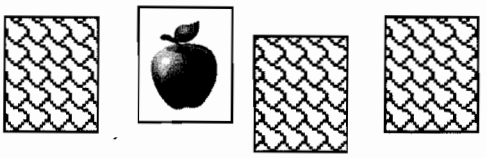
T3

Ella is teaching her little brother Sammy to play a memory game.



1. She starts with four cards, two have a picture of an apple on them and two have a picture of bananas.

   The cards are laid on the table with the pictures hidden, and then mixed up.
   Ella says 'you can turn over two cards and you win if they are the same'.

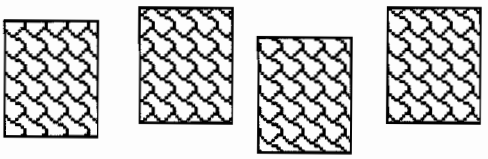


   Sammy turns over one card. It has an apple on it. Then he turns over another card.
   What is the probability that the second card has an apple on it?
   Explain how you figured it out.

1/3 ✓ 1

He already knows one is an apple, there is one more apple and 3 cards. ✓ 1

2. Sammy did not get two cards the same. Ella turns the cards back over so that the pictures do not show, but she did not mix up the cards.

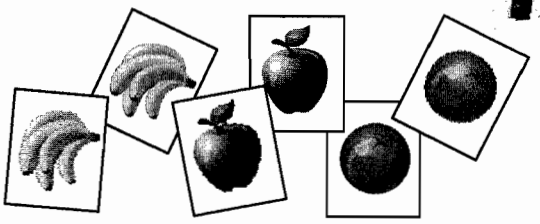


   Sammy is good at remembering where things are.
   He turns over one card and then another.
   How should he choose the first card to turn over so that he can be sure to win?

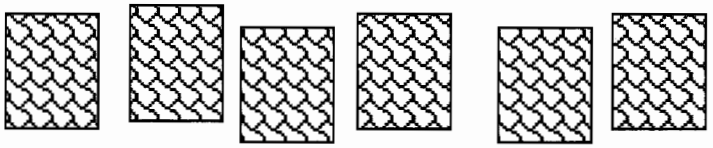
Pick one of the cards he didn't pick the first time, so he can choose the right one. ✓ 1

T3

3. Ella adds two cards with pictures of an orange, making six cards all together.



She lays all the cards down with the pictures hidden and mixes them up.



Sammy turns over one card and then another.

What is the probability that they are both the same?
Explain how you figured it out.

1/5 ✓ 1

There is one more of that card and 5 cards left. ✓ 2

4. What is the probability that they both have pictures of a banana?
Show how you worked it out.

1/18 × 0

He can get 2 bananas twice, and there is 36 combinations. Simplify.

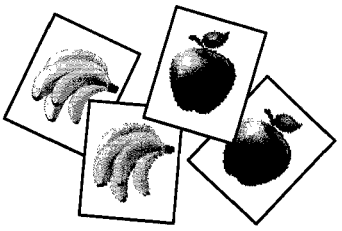
0

Memory game

T4

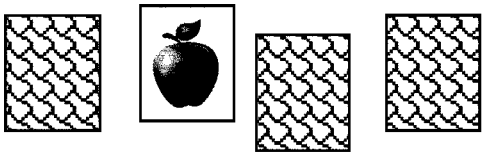
This problem gives you the chance to:
- work out probabilities

Ella is teaching her little brother Sammy to play a memory game.



1. She starts with four cards, two have a picture of an apple on them and two have a picture of bananas.

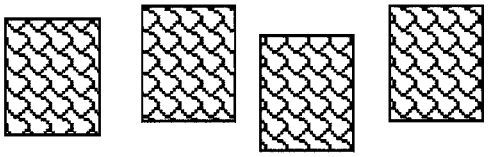
   The cards are laid on the table with the pictures hidden, and then mixed up.
   Ella says 'you can turn over two cards and you win if they are the same'.



   Sammy turns over one card. It has an apple on it. Then he turns over another card.
   What is the probability that the second card has an apple on it? 1/3 ✓ 1
   Explain how you figured it out.

   3 cards left one of them is an apple so 1/3 ✓ 1

2. Sammy did not get two cards the same. Ella turns the cards back over so that the pictures do not show, but she did not mix up the cards.

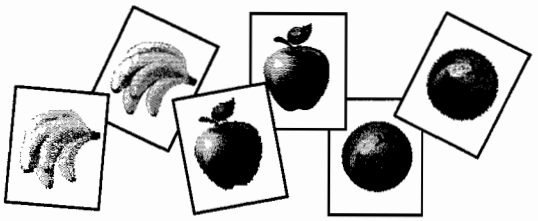


   Sammy is good at remembering where things are.
   He turns over one card and then another.
   How should he choose the first card to turn over so that he can be sure to win? ✓

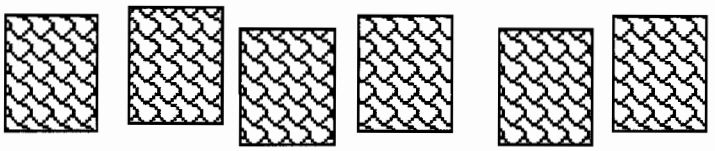
   Not the one that he chose to do last time 1

T4

3. Ella adds two cards with pictures of an orange, making six cards all together.



She lays all the cards down with the pictures hidden and mixes them up.



Sammy turns over one card and then another.

What is the probability that they are both the same? Explain how you figured it out.

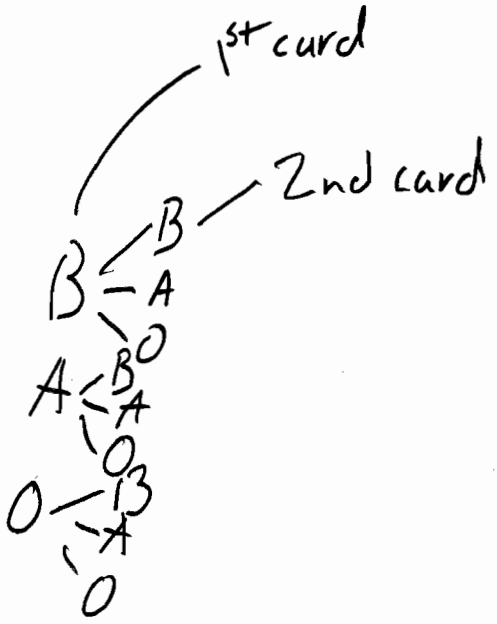
1/3 × O

it would be 2/6 because 6 cards and 3 sets of 2 so it is 2/6 or 1/3 × O

4. What is the probability that they both have pictures of a banana? Show how you worked it out.

1/9 × O

B = bannas
A = apples
O = oranges



BB - 1
BA - 2
BO - 3
AB - 4
AA - 5
AO - 6
OB - 7
OA - 8
OO - 9

O

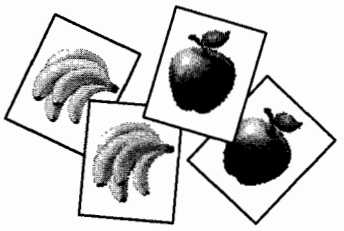
8

Memory game

This problem gives you the chance to:
• work out probabilities

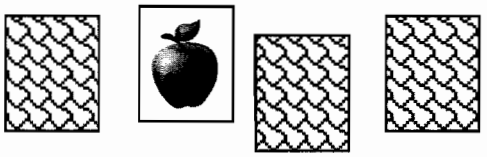
T5

Ella is teaching her little brother Sammy to play a memory game.



1. She starts with four cards, two have a picture of an apple on them and two have a picture of bananas.

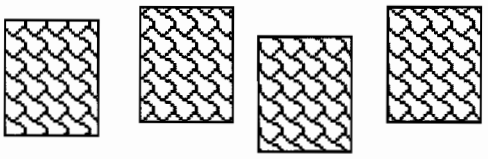
   The cards are laid on the table with the pictures hidden, and then mixed up.
   Ella says 'you can turn over two cards and you win if they are the same'.



   Sammy turns over one card. It has an apple on it. Then he turns over another card.
   What is the probability that the second card has an apple on it? 1/3. ✓ 1
   Explain how you figured it out.

   There are 3 possible cards, and 1 has an apple. ✓ 1

2. Sammy did not get two cards the same. Ella turns the cards back over so that the pictures do not show, but she did not mix up the cards.

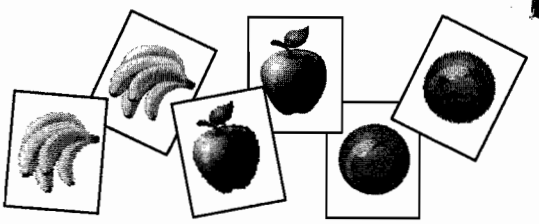


   Sammy is good at remembering where things are.
   He turns over one card and then another.
   How should he choose the first card to turn over so that he can be sure to win?

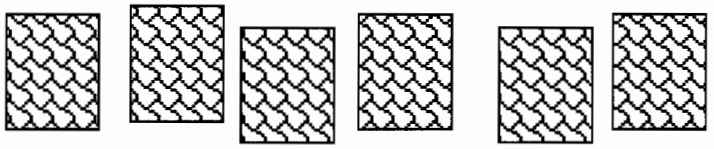
   He should turn a card he hasn't seen yet. ✓ 1

T5

3. Ella adds two cards with pictures of an orange, making six cards all together.



She lays all the cards down with the pictures hidden and mixes them up.



Sammy turns over one card and then another.

What is the probability that they are both the same?
Explain how you figured it out.

1/5. ✓ 1

It doesn't matter what the first card is, and there's a 1/5 chance of card 2 being the same as card 1. 1 × 1/5 = 1/5. ✓ 2

4. What is the probability that they both have pictures of a banana?
Show how you worked it out.

1/15 ✓ 1

1/3 × 1/5 = 1/15 ✓ 1

Memory game

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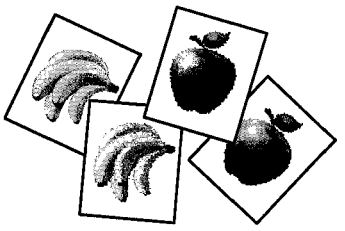
• work out probabilities

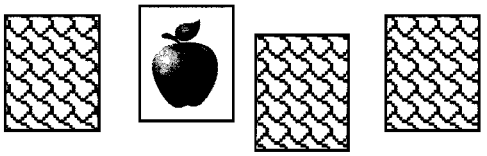
S1

Ella is teaching her little brother Sammy to play a memory game.



1. She starts with four cards, two have a picture of an apple on them and two have a picture of bananas.

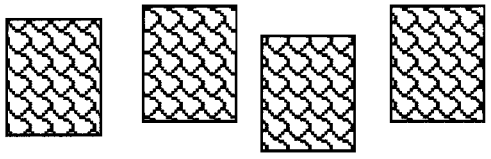
   The cards are laid on the table with the pictures hidden, and then mixed up.
   Ella says 'you can turn over two cards and you win if they are the same'.



   Sammy turns over one card. It has an apple on it. Then he turns over another card.
   What is the probability that the second card has an apple on it? 1 out of three ✓ 1
   Explain how you figured it out.

There are three cards left and only one has an apple on it. ✓ 1

2. Sammy did not get two cards the same. Ella turns the cards back over so that the pictures do not show, but she did not mix up the cards.

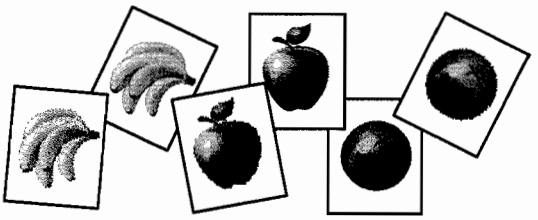


   Sammy is good at remembering where things are.
   He turns over one card and then another.
   How should he choose the first card to turn over so that he can be sure to win?

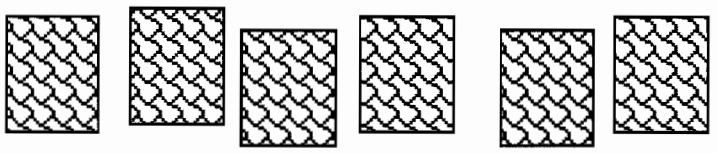
He should take a card he has not chosen. ✓ 1

S1

3. Ella adds two cards with pictures of an orange, making six cards all together.



She lays all the cards down with the pictures hidden and mixes them up.



Sammy turns over one card and then another.

What is the probability that they are both the same? Explain how you figured it out.

1 out of five ✓ 1

The first can be an apple, a banana or an orange. There are 5 left and one is the same. ✓ 2

4. What is the probability that they both have pictures of a banana? Show how you worked it out.

2 out of thirty ✓ 1

$\frac{2}{6}$ is 2 bananas out of six cards

$\frac{1}{5}$ is 1 banana out of five cards

$\frac{2}{6} \cdot \frac{1}{5} = \frac{2}{30}$ ✓ 1

8

Memory game

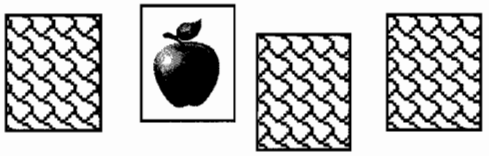
This problem gives you the chance to:
- work out probabilities

S2

Ella is teaching her little brother Sammy to play a memory game.

1. She starts with four cards, two have a picture of an apple on them and two have a picture of bananas.

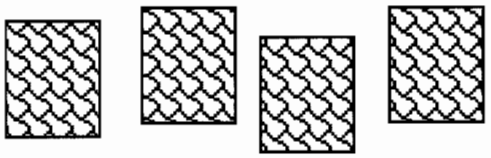
   The cards are laid on the table with the pictures hidden, and then mixed up.
   Ella says 'you can turn over two cards and you win if they are the same'.



   Sammy turns over one card. It has an apple on it. Then he turns over another card.
   What is the probability that the second card has an apple on it? $\frac{1}{3}$ ✓ 1
   Explain how you figured it out.

   Theres only 1 apple left in the 3 reumaning cards ✓ 1

2. Sammy did not get two cards the same. Ella turns the cards back over so that the pictures do not show, but she did not mix up the cards.

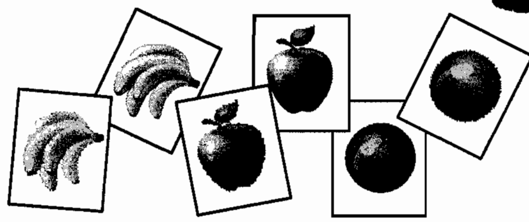


   Sammy is good at remembering where things are.
   He turns over one card and then another.
   How should he choose the first card to turn over so that he can be sure to win?

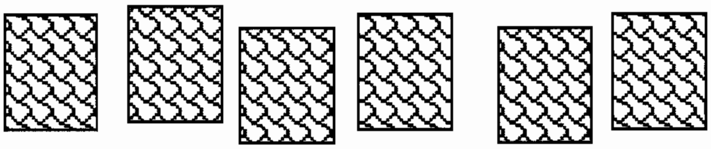
   He should pick one of the cards that he didn't flip over. ✓ 1

S2

3. Ella adds two cards with pictures of an orange, making six cards all together.



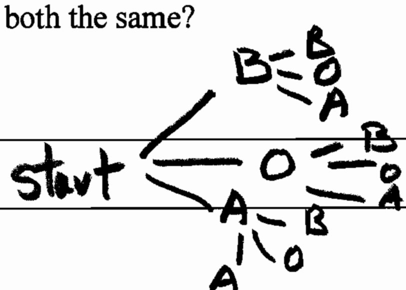
She lays all the cards down with the pictures hidden and mixes them up.



Sammy turns over one card and then another.

What is the probability that they are both the same? 3/9, 1/3 ✗ 0
Explain how you figured it out.

fraction tree ✗ 0



4. What is the probability that they both have pictures of a banana? 1/14 ✗ 0
Show how you worked it out.

B B
B O
B O
B A
B A
O O
O B
O B
O A
O A

A B
A O
A O
A B
A A

✓ 1

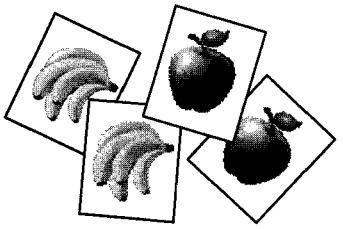
 (4)

Memory game

This problem gives you the chance to:
- work out probabilities

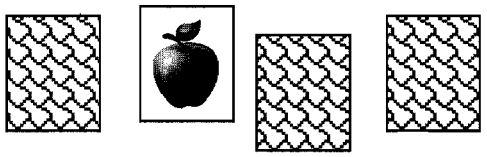
S3

Ella is teaching her little brother Sammy to play a memory game.



1. She starts with four cards, two have a picture of an apple on them and two have a picture of bananas.

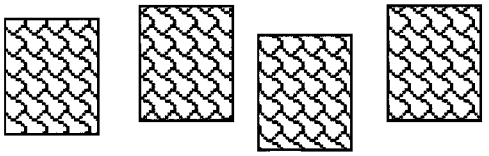
   The cards are laid on the table with the pictures hidden, and then mixed up.
   Ella says 'you can turn over two cards and you win if they are the same'.



   Sammy turns over one card. It has an apple on it. Then he turns over another card.
   What is the probability that the second card has an apple on it? 1/3 ✓ 1
   Explain how you figured it out.

There are 3 cards. 2 of them are not apples. 1 is. So 1/3 of them are apples ✓ 1

2. Sammy did not get two cards the same. Ella turns the cards back over so that the pictures do not show, but she did not mix up the cards.

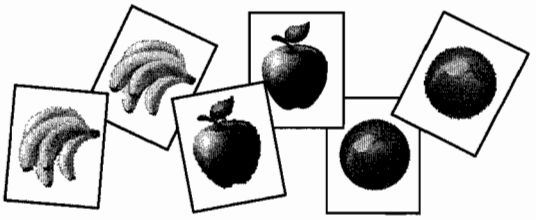


   Sammy is good at remembering where things are.
   He turns over one card and then another.
   How should he choose the first card to turn over so that he can be sure to win?

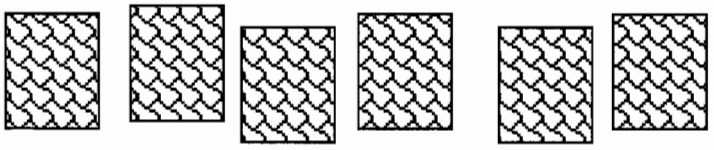
He should choose the one he didn't get. ✓ 1

S3

3. Ella adds two cards with pictures of an orange, making six cards all together.



She lays all the cards down with the pictures hidden and mixes them up.



Sammy turns over one card and then another.

What is the probability that they are both the same?
Explain how you figured it out.

1/5 ✓ 1

She Picks one card there 5 left
1/5 is right ✓ 2

4. What is the probability that they both have pictures of a banana?
Show how you worked it out.

1/36 × 0

$\frac{1}{6} \cdot \frac{1}{6} = \frac{1}{36}$ 0

8

Memory game

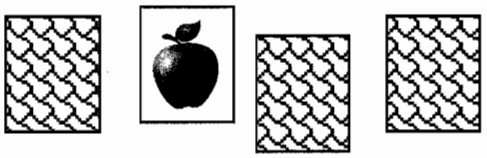
This problem gives you the chance to:
• work out probabilities

S4

Ella is teaching her little brother Sammy to play a memory game.

1. She starts with four cards, two have a picture of an apple on them and two have a picture of bananas.

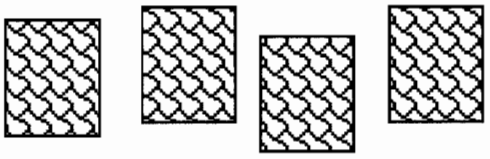
   The cards are laid on the table with the pictures hidden, and then mixed up.
   Ella says 'you can turn over two cards and you win if they are the same'.



   Sammy turns over one card. It has an apple on it. Then he turns over another card.
   What is the probability that the second card has an apple on it? 1/3 ✓ 1
   Explain how you figured it out.

   There's only 1 apple left in the 3 other cards ✓ 1

2. Sammy did not get two cards the same. Ella turns the cards back over so that the pictures do not show, but she did not mix up the cards.

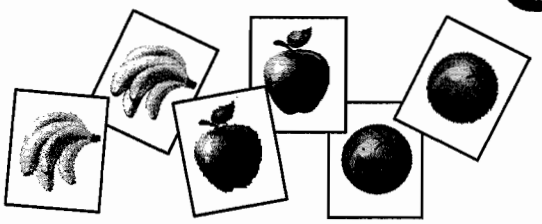


   Sammy is good at remembering where things are.
   He turns over one card and then another.
   How should he choose the first card to turn over so that he can be sure to win?

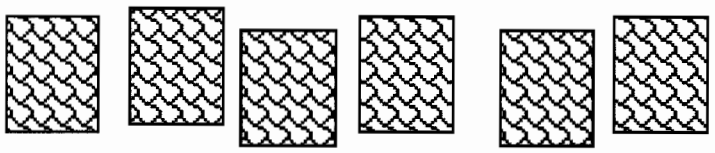
   He should pick the banana card he picked last time because he knows where the apple is and has a good chance of picking another banana. × 0

S4

3. Ella adds two cards with pictures of an orange, making six cards all together.



She lays all the cards down with the pictures hidden and mixes them up.



Sammy turns over one card and then another.

What is the probability that they are both the same? 1/5 ✓ 1
Explain how you figured it out.

If the first is apple then 1 apple left in the 5 and same for banana and orange ✓ 2

4. What is the probability that they both have pictures of a banana? 1/15 ✓ 1
Show how you worked it out.

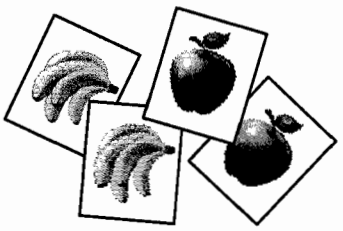
Theres 1/5 for apple, banana or orange being both the same but now its just 2 bananas so theres 1 in 15 ways ✓ 1

Memory game

This problem gives you the chance to:
- work out probabilities

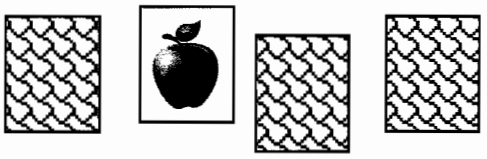
S5

Ella is teaching her little brother Sammy to play a memory game.



1. She starts with four cards, two have a picture of an apple on them and two have a picture of bananas.

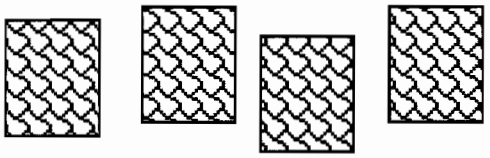
   The cards are laid on the table with the pictures hidden, and then mixed up.
   Ella says 'you can turn over two cards and you win if they are the same'.



   Sammy turns over one card. It has an apple on it. Then he turns over another card.
   What is the probability that the second card has an apple on it? P(33%) or $(\frac{1}{3})$ ✓ 1
   Explain how you figured it out.

   since 1 is already flipped over it is out of 3. ✓ 1

2. Sammy did not get two cards the same. Ella turns the cards back over so that the pictures do not show, but she did not mix up the cards.

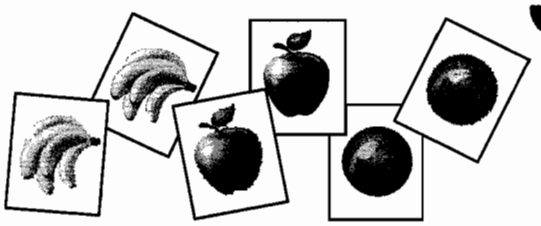


   Sammy is good at remembering where things are.
   He turns over one card and then another.
   How should he choose the first card to turn over so that he can be sure to win?

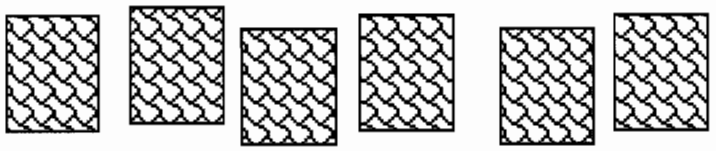
   Flip a different card then what he picked last time. ✓ 1

S5

3. Ella adds two cards with pictures of an orange, making six cards all together.



She lays all the cards down with the pictures hidden and mixes them up.



Sammy turns over one card and then another.

What is the probability that they are both the same?
Explain how you figured it out.

P($\frac{1}{36}$) × 0

there is $\frac{1}{6}$ chance of getting one of them, × $\frac{1}{6}$ chance of getting the other × 0

4. What is the probability that they both have pictures of a banana?
Show how you worked it out.

P($\frac{8}{15}$) × 0

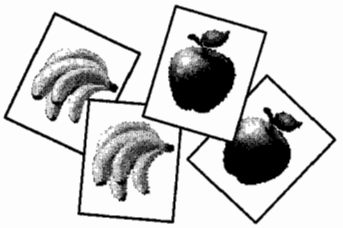
$\frac{2}{6} + \frac{1}{5} = \frac{8}{15}$ 0

Memory game

This problem gives you the chance to:
- work out probabilities

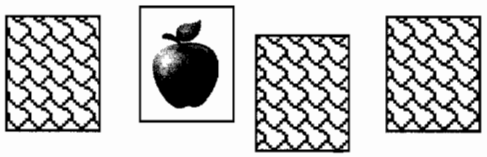
S6

Ella is teaching her little brother Sammy to play a memory game.



1. She starts with four cards, two have a picture of an apple on them and two have a picture of bananas.

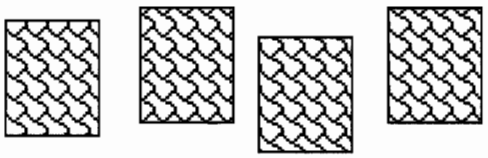
   The cards are laid on the table with the pictures hidden, and then mixed up.
   Ella says 'you can turn over two cards and you win if they are the same'.



   Sammy turns over one card. It has an apple on it. Then he turns over another card.
   What is the probability that the second card has an apple on it? 1:3 ✓ 1
   Explain how you figured it out.

   There are three cards left, and only one is an apple. ✓ 1

2. Sammy did not get two cards the same. Ella turns the cards back over so that the pictures do not show, but she did not mix up the cards.

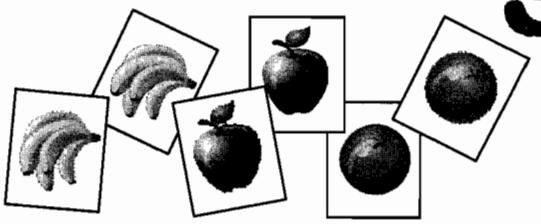


   Sammy is good at remembering where things are.
   He turns over one card and then another.
   How should he choose the first card to turn over so that he can be sure to win?

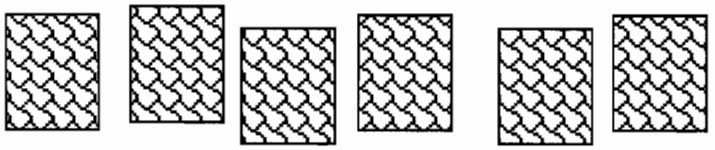
   He shouldn't choose the same card he picked last time. Then he'll know what's under the other three cards. 1

S6

3. Ella adds two cards with pictures of an orange, making six cards all together.



She lays all the cards down with the pictures hidden and mixes them up.



Sammy turns over one card and then another.

What is the probability that they are both the same?
Explain how you figured it out.

1:5 ✓ 1

There are 5 cards left. ✓ 2

4. What is the probability that they both have pictures of a banana?
Show how you ~~worked it out~~

1:15 ✓ 1

15 combinations ✓ 1

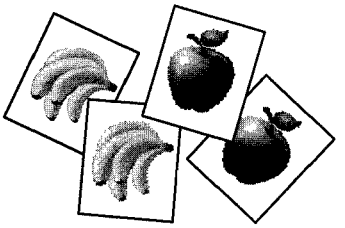
A - B C
A B C

Memory game

This problem gives you the chance to:
- work out probabilities

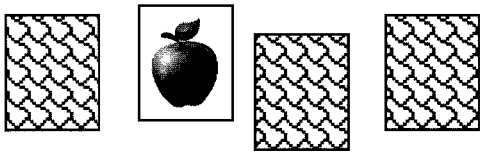
S7

Ella is teaching her little brother Sammy to play a memory game.



1. She starts with four cards, two have a picture of an apple on them and two have a picture of bananas.

   The cards are laid on the table with the pictures hidden, and then mixed up.
   Ella says 'you can turn over two cards and you win if they are the same'.

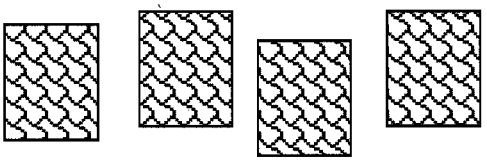


   Sammy turns over one card. It has an apple on it. Then he turns over another card.
   What is the probability that the second card has an apple on it? $\frac{1}{3}$ ✓ 1
   Explain how you figured it out.

There is only one apple and there is two bananas left = $\frac{1}{3}$ ✓ 1

a+b+b = $\frac{1}{3}$ or getting another apple

2. Sammy did not get two cards the same. Ella turns the cards back over so that the pictures do not show, but she did not mix up the cards.

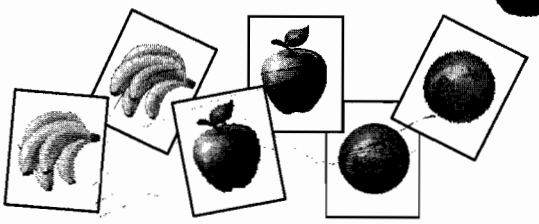


   Sammy is good at remembering where things are.
   He turns over one card and then another.
   How should he choose the first card to turn over so that he can be sure to win?

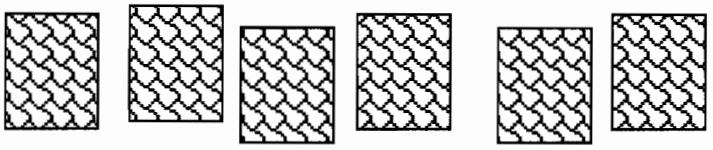
He should turn over the apple that was face up so he can win × 0

S7

3. Ella adds two cards with pictures of an orange, making six cards all together.



She lays all the cards down with the pictures hidden and mixes them up.



Sammy turns over one card and then another.

What is the probability that they are both the same?
Explain how you figured it out.

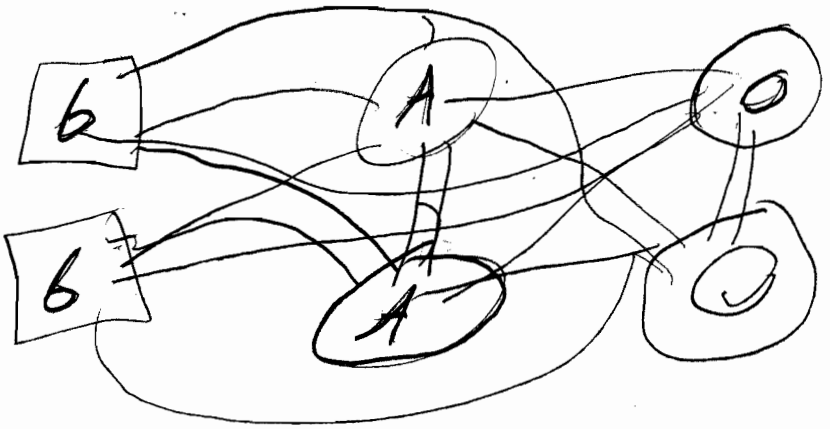
$\frac{1}{3}$ x 0

0

There are $\frac{1}{3}$ because you could get matches 3 different ways and you can get no matches six ways

4. What is the probability that they both have pictures of a banana?
Show how you worked it out.

$\frac{2}{17}$ x 0



0

BB, BB, BA, BA, BA, BA, BO, BO, BO, BO, AA, AA, OO, AO, AO, OA, OA

8

Memory game

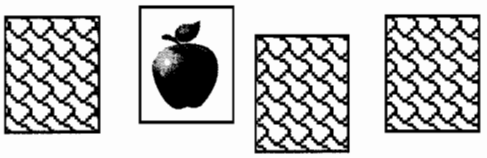
This problem gives you the chance to:
• work out probabilities

S8

Ella is teaching her little brother Sammy to play a memory game.

1. She starts with four cards, two have a picture of an apple on them and two have a picture of bananas.

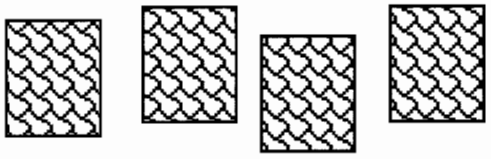
   The cards are laid on the table with the pictures hidden, and then mixed up.
   Ella says 'you can turn over two cards and you win if they are the same'.



   Sammy turns over one card. It has an apple on it. Then he turns over another card.
   What is the probability that the second card has an apple on it? 1/3 chance ✓ 1
   Explain how you figured it out.

well there is only 1 apple left out of 3 cards ✓ 1

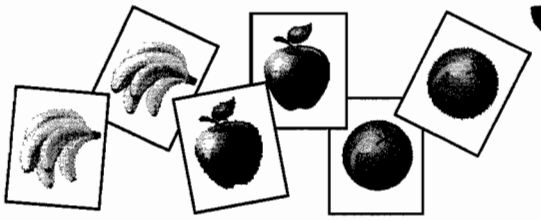
2. Sammy did not get two cards the same. Ella turns the cards back over so that the pictures do not show, but she did not mix up the cards.



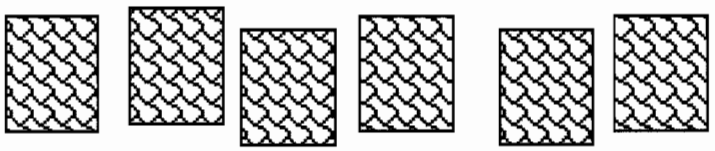
   Sammy is good at remembering where things are.
   He turns over one card and then another.
   How should he choose the first card to turn over so that he can be sure to win?

He should pick one he hasn't picked so ✓ 1
when he sees it he knows where the other is

3. Ella adds two cards with pictures of an orange, making six cards all together.



She lays all the cards down with the pictures hidden and mixes them up.



Sammy turns over one card and then another.

What is the probability that they are both the same? Explain how you figured it out.

1/5 chance ✓ 1

If you pick the first one there is 1 left the same of 5 left. ✓ 2

4. What is the probability that they both have pictures of a banana? Show how you worked it out.

8/15 × 0

$\frac{2}{6} \times \frac{1}{5} = \frac{8}{15}$ ✓ ✓

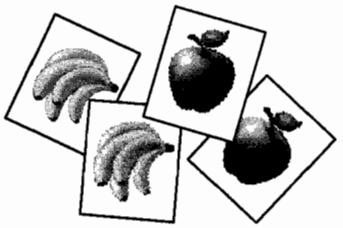
0

Memory game

This problem gives you the chance to:
• work out probabilities

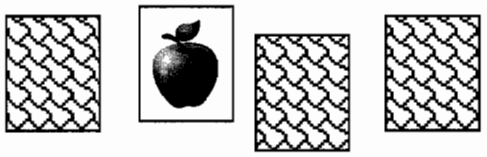
S9

Ella is teaching her little brother Sammy to play a memory game.



1. She starts with four cards, two have a picture of an apple on them and two have a picture of bananas.

   The cards are laid on the table with the pictures hidden, and then mixed up.
   Ella says 'you can turn over two cards and you win if they are the same'.

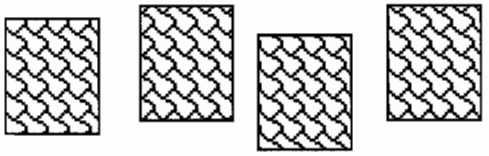


   Sammy turns over one card. It has an apple on it. Then he turns over another card.
   What is the probability that the second card has an apple on it?
   Explain how you figured it out.

$\frac{1}{3}$ ✓ 1

because there are 3 cards left once you flip the first card. 1

2. Sammy did not get two cards the same. Ella turns the cards back over so that the pictures do not show, but she did not mix up the cards.



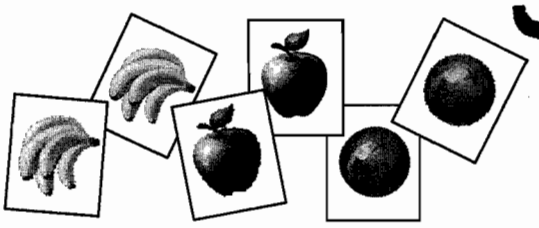
   Sammy is good at remembering where things are.
   He turns over one card and then another.
   How should he choose the first card to turn over so that he can be sure to win?

✓

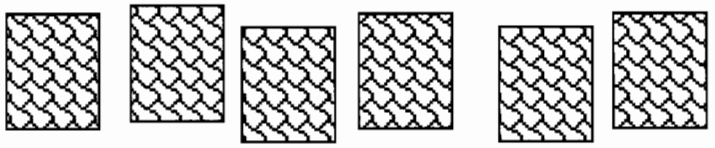
he turns a card that he did not pick and then match the card with a card he did pick. 1

S9

3. Ella adds two cards with pictures of an orange, making six cards all together.



She lays all the cards down with the pictures hidden and mixes them up.



Sammy turns over one card and then another.

What is the probability that they are both the same? $\frac{1}{5}$ ✓ 1

Explain how you figured it out.

because thats the number Sammy ✓
left over once he picks up one ✓ card 2

4. What is the probability that they both have pictures of a banana? $\frac{1}{3}$ × 0

Show how you worked it out.

0

1

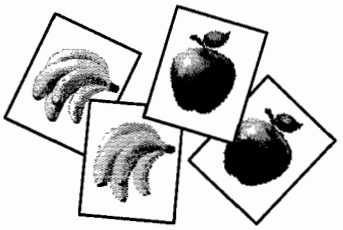
8

Memory game

This problem gives you the chance to:
- work out probabilities

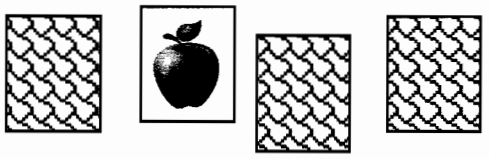
S10

Ella is teaching her little brother Sammy to play a memory game.



1. She starts with four cards, two have a picture of an apple on them and two have a picture of bananas.

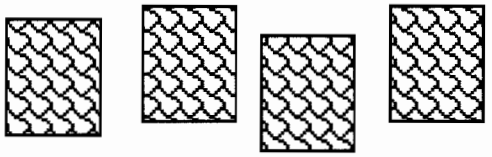
   The cards are laid on the table with the pictures hidden, and then mixed up.
   Ella says 'you can turn over two cards and you win if they are the same'.



   Sammy turns over one card. It has an apple on it. Then he turns over another card.
   What is the probability that the second card has an apple on it? 33.3% ✓ 1
   Explain how you figured it out.

There are 3 choices left. The apple has to be one of them. $\frac{1}{3}$ = 33.3% ✓ 1

2. Sammy did not get two cards the same. Ella turns the cards back over so that the pictures do not show, but she did not mix up the cards.

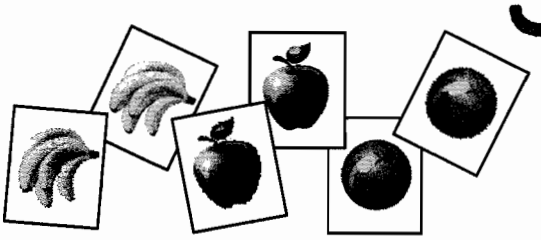


   Sammy is good at remembering where things are.
   He turns over one card and then another.
   How should he choose the first card to turn over so that he can be sure to win?

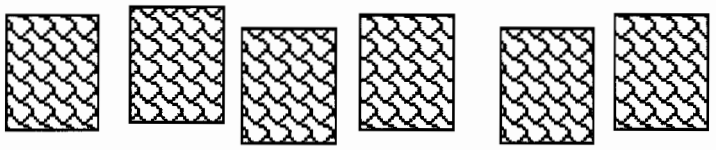
He should pick on of the 2 he picked before. Then there are two options and a 50.50 chance. ✗ 0

S10

3. Ella adds two cards with pictures of an orange, making six cards all together.



She lays all the cards down with the pictures hidden and mixes them up.



Sammy turns over one card and then another.

What is the probability that they are both the same? 20% ✓ 1

Explain how you figured it out.

2 Apples $\frac{2}{6} \cdot \frac{1}{5} = \frac{2}{30}$

2 Oranges $\frac{2}{30}$ 2 bananas $\frac{2}{30}$ ✓ 2

$\frac{6}{30} = 20\%$

4. What is the probability that they both have pictures of a banana? 6.6% ✓ 1

Show how you worked it out.

$\frac{2}{30} = 6.\overline{6}\%$ ✓ 1