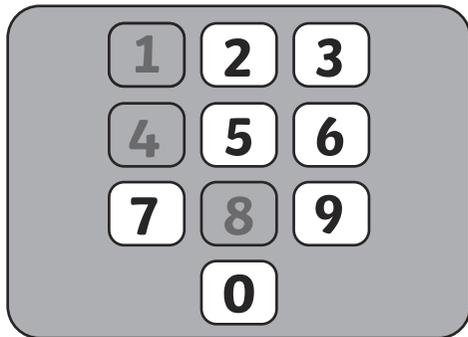




# Jazz Harper: Space Explorer Crack the Code - Answers

Jazz and Elijah are trying to reach the Mars buggy for a lesson with Mr Moustache. They got left behind and now, in order to make it to the lesson, they must crack the code for the airlock keypads. Jazz has already identified that the worn-away numbers on the keypad are part of the code. Can you identify the codes and make it to the Mars buggy?

This keypad has a three-digit code.

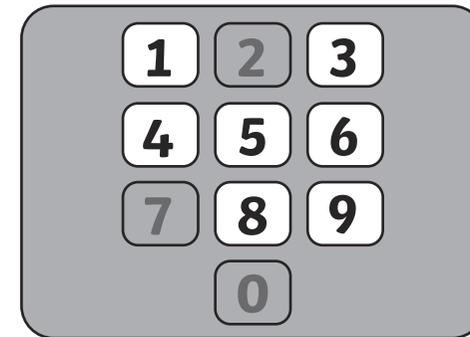


How many possible codes could there be?  
The first two possible codes have been done for you.

1, 4, 8	1, 8, 4
4, 1, 8	4, 8, 1
8, 1, 4	8, 4, 1

Is there a systematic way to work out all the codes?

This keypad has a three-digit code.



How many possible codes could there be?  
The first two possible codes have been done for you.

2, 7, 0	2, 0, 7
7, 2, 0	7, 0, 2
0, 2, 7	0, 7, 2

Is there a systematic way to work out all the codes?

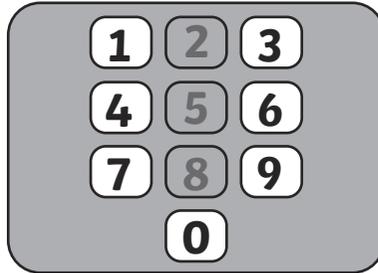
Jazz realises that the second keypad actually has a four-digit code. The zero was worn away the most so that must be pressed twice. How does this change the code options?

2, 7, 0, 0	2, 0, 7, 0	2, 0, 0, 7	7, 2, 0, 0	7, 0, 2, 0	7, 0, 0, 2	0, 2, 7, 0	0, 2, 0, 7	0, 0, 2, 7	0, 7, 2, 0	0, 7, 0, 2	0, 0, 7, 2
------------	------------	------------	------------	------------	------------	------------	------------	------------	------------	------------	------------

# Jazz Harper: Space Explorer Crack the Code

Jazz and Elijah are trying to reach the Mars buggy for a lesson with Mr Moustache. They got left behind and now, in order to make it to the lesson, they must crack the code for the airlock keypads. Jazz has already identified that the worn-away numbers on the keypad are part of the code. Can you identify the codes and make it to the Mars buggy?

This keypad has a four-digit code. The two is pressed twice.



How many possible codes could there be?  
Some have been done for you.

5, 2, 2, 8    5, 2, 8, 2    5, 8, 2, 2

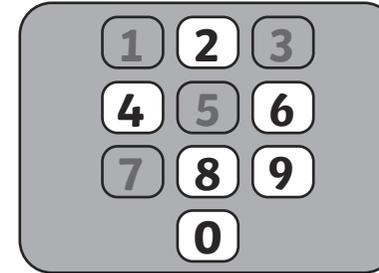
---

---

---

Is there a systematic way to work out all the codes?

This keypad has a four-digit code.



How many possible codes could there be?  
Some have been done for you.

1, 3, 5, 7    1, 3, 7, 5

---

---

---

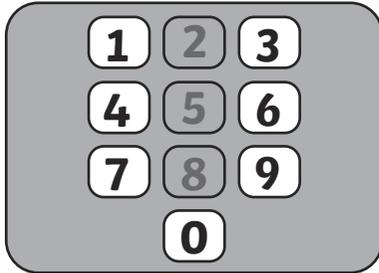
Is there a systematic way to work out all the codes?

Elijah says that if a four-digit code uses the same digit twice, it will still have the same number of possibilities as a code with four different digits. Jazz disagrees. Who is correct? Can you explain your reasoning?

# Jazz Harper: Space Explorer Crack the Code - Answers

Jazz and Elijah are trying to reach the Mars buggy for a lesson with Mr Moustache. They got left behind and now, in order to make it to the lesson, they must crack the code for the airlock keypads. Jazz has already identified that the worn-away numbers on the keypad are part of the code. Can you identify the codes and make it to the Mars buggy?

This keypad has a four-digit code. The two is pressed twice.



How many possible codes could there be?  
Some have been done for you.

5, 2, 2, 8   5, 2, 8, 2   5, 8, 2, 2

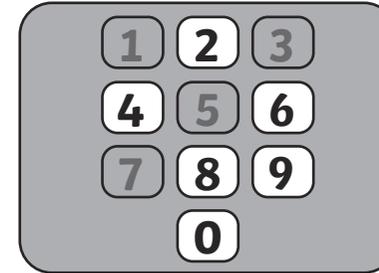
8, 2, 5, 2   8, 2, 2, 5   8, 5, 2, 2

2, 2, 5, 8   2, 2, 8, 5   2, 5, 2, 8   2, 5, 8, 2   2, 8, 2, 5

2, 8, 5, 2

Is there a systematic way to work out all the codes?

This keypad has a four-digit code.



How many possible codes could there be?  
Some have been done for you.

1, 3, 5, 7   1, 3, 7, 5   1, 7, 3, 5   1, 7, 5, 3   1, 5, 7, 3   1, 5, 3, 7

3, 1, 5, 7   3, 1, 7, 5   3, 5, 1, 7   3, 5, 7, 1   3, 7, 1, 5   3, 7, 5, 1

5, 1, 3, 7   5, 1, 7, 3   5, 7, 1, 3   5, 7, 3, 1   5, 3, 7, 1   5, 3, 1, 7

7, 1, 3, 5   7, 1, 5, 3   7, 3, 1, 5   7, 3, 5, 1   7, 5, 1, 3   7, 5, 3, 1

Is there a systematic way to work out all the codes?

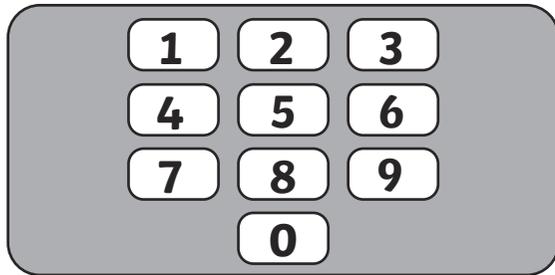
Elijah says that if a four-digit code uses the same digit twice, it will still have the same number of possibilities as a code with four different digits. Jazz disagrees. Who is correct? Can you explain your reasoning?

**Accept any correct explanation that shows that Jazz is correct. When the digits are pressed twice, there will be fewer combinations than if there were four different digits.**

# Jazz Harper: Space Explorer Crack the Code

Jazz and Elijah are trying to reach the Mars buggy for a lesson with Mr Moustache. They got left behind and now, in order to make it to the lesson, they must crack the code for the airlock keypads.

This is the keypad.



Use this space to show your examples.

Elijah says that if a four-digit code uses the same digit twice, it will still have the same number of solutions as a code with four different digits. Jazz disagrees.

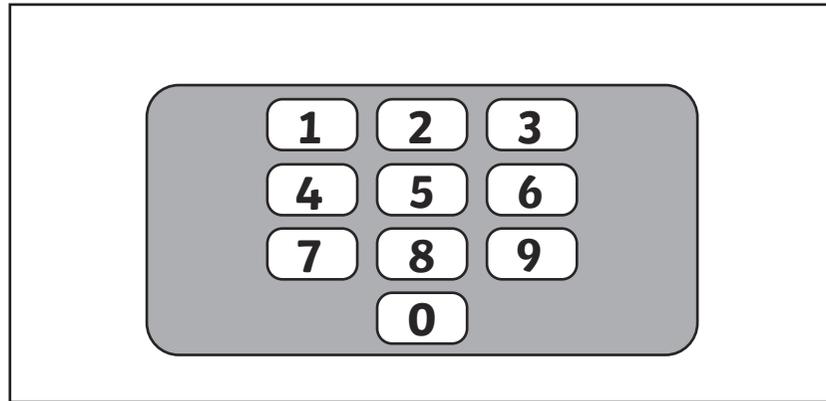
Prove that Jazz is correct using examples.

Jazz is correct because \_\_\_\_\_

Challenge: Can you make your own statement about a four-digit code and prove whether it is true or false?

# Jazz Harper: Space Explorer Crack the Code - Answers

Jazz and Elijah are trying to reach the Mars buggy for a lesson with Mr Moustache. They got left behind and now, in order to make it to the lesson, they must crack the code for the airlock keypads.



Elijah says that if a four-digit code uses the same digit twice, it will still have the same number of solutions as a code with four different digits. Jazz disagrees.

Prove that Jazz is correct using examples.

Jazz is correct because

**Accept any explanation that explains that, if any digit is repeated, there will be fewer possibilities. If two digits in the code are the same, swapping them round will no longer create a new code, and there will be fewer solutions.**