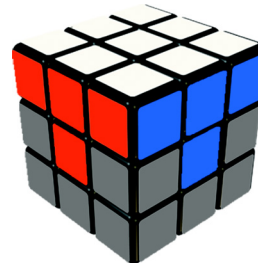


The WHITE Corners

Lesson 3



Lesson 2 Review

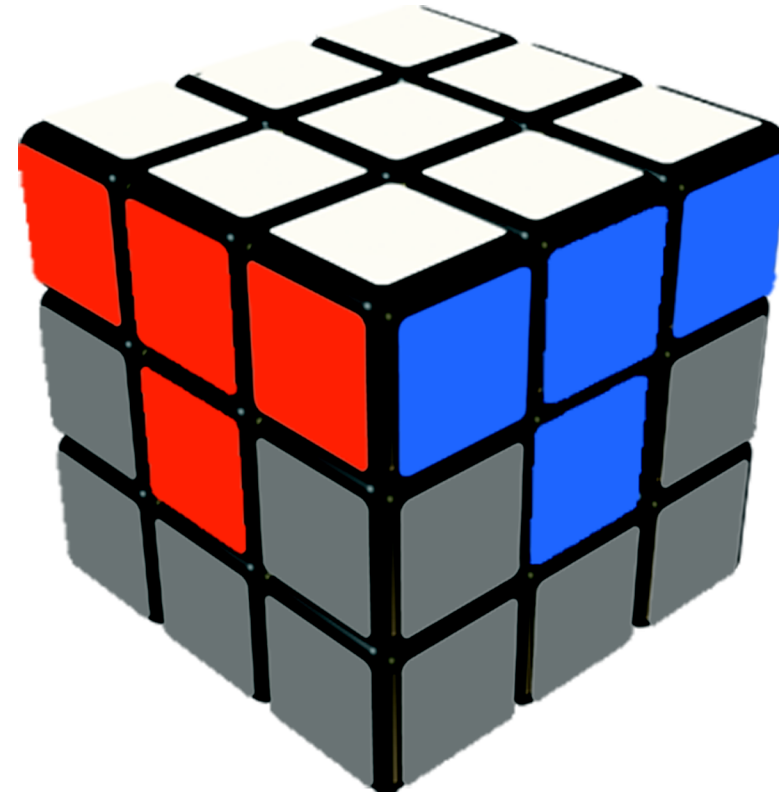
Vocabulary

Lesson Focus

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Rubik's Trivia



GOAL: The **WHITE** Corners

The goal of this stage is to get the **WHITE** corners on the **UP** face with the **TOP** layer of each face matching the center piece.

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Lesson Focus

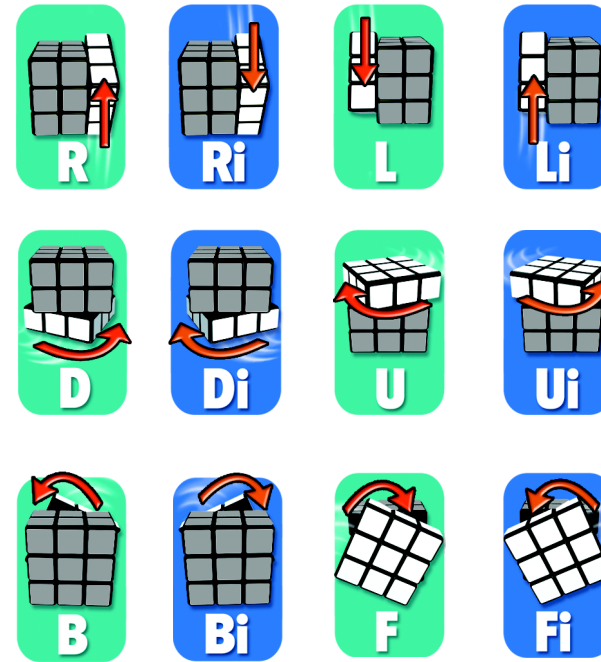
Lesson Review

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Rubik's Trivia



PP3



1/4 Turns

R	U
Ri	Ui
L	B
Li	Bi
D	F
Di	Fi

- Inverted means opposite.
- By inverting a move, the move can be undone.



Layer and Faces

- “Layers” are three-dimensional (Length, width and height).
- The word “face” refers to the flat area of a “layer”. Faces are two-dimensional (length and width).

LEFT Face of the Cube



Left layer of the Cube

RIGHT Face of the Cube



Right layer of the Cube

FRONT Face of the Cube



Front layer of the Cube

DOWN Face of the Cube



Bottom layer of the Cube

UP Face of the Cube



Top layer of the Cube

BACK Face of the Cube

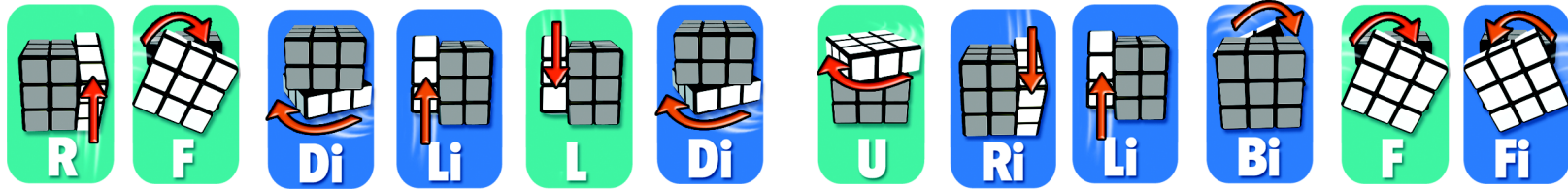


Back layer of the Cube



PP5

SCRAMBLED CUBE 25 Random ¼ Turns



Lesson 2 Review

Vocabulary

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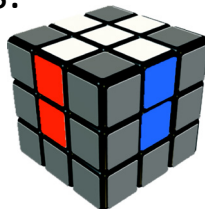
Rubik's Trivia



PP6

REVIEW FROM THE WHITE CROSS

To get the **WHITE** edges matched with the correct faces:



- Make sure the **WHITE** face is **UP**.
- Find a **WHITE** edge.
- Twist the row of the cube that has the **WHITE** edge until the **WHITE** edge is on the **BOTTOM** layer.
- Twist the **DOWN** face “D” ¼ turn.



- Put the layer you moved back to where it was originally.
- Put the **WHITE** edge directly below the matching colored center piece.
- Place on the **RIGHT** face. Make two “R” ¼ turns, so the **WHITE** edge is on the **TOP** layer.



- Repeat all the steps for each **WHITE** edge.
- If the pattern is not **WHITE, WHITE** use the sequence to correct the pattern:



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ALGORITHM

An algorithm is a set of rules or set of steps that we use to solve math problems.



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PERMUTATION

A Permutation is a combination of moves or a variation of possible arrangements of moves.

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Rubik's Trivia



To get the
WHITE/BLUE/RED
corner in the correct
position:

- Position the **WHITE** face as the **UP** face.
- Position the **BLUE** face as the **RIGHT** face.
- Position the **RED** face as the **FRONT** face.
- Find the **WHITE/BLUE/RED** corner.
- If the **WHITE/BLUE/RED** corner is on the **TOP** layer, move it to the **BOTTOM** layer.
 - Make a $\frac{1}{4}$ turn until the **WHITE/BLUE/RED** corner piece is on the **BOTTOM** layer.
 - Twist the **DOWN** face a “**D**” $\frac{1}{4}$ turn.
 - After completing the “**D**” turn, reverse the original $\frac{1}{4}$ turn to the previous position.



- Once the **WHITE/BLUE/RED** corner piece is on the **BOTTOM** layer, twist the **DOWN** face of the cube until the **WHITE/BLUE/RED** corner is directly below its intended position, at the bottom, right-hand corner of the cube.
- You may have to perform more than one $\frac{1}{4}$ turn permutation to get the corner underneath its intended position.

- Your cube should look like one of these pictures:



Lesson 2 Review

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To get the **WHITE/BLUE/RED** corner in the correct position:

- With the **WHITE/BLUE/RED** corner directly below its intended position, with the **BLUE** face as the **RIGHT** face, do the following algorithm:



- Repeat the algorithm, keeping the **RED** face as the **FRONT** face, (without turning the cube), until the **WHITE/BLUE/RED** corner is in its correct position on the **TOP** layer.



- Position the **WHITE** face as the **UP** face.
- Position the **ORANGE** face as the **RIGHT** face.
- Position the **BLUE** face as the **FRONT** face.
- Find the **WHITE/ORANGE/BLUE** corner.
- If the **WHITE/ORANGE/BLUE** corner is on the **TOP** layer, move it to the **BOTTOM** layer.
 - Make a $\frac{1}{4}$ turn until the **WHITE/ORANGE/BLUE** corner piece is on the **BOTTOM** layer.
 - Twist the **DOWN** face a “D” $\frac{1}{4}$ turn.
 - Reverse the original $\frac{1}{4}$ turn to the previous position.

To get the **WHITE/ORANGE/BLUE** corner in the correct position:

- Once the **WHITE/ORANGE/BLUE** corner piece is on the **BOTTOM** layer, twist the **DOWN** face of the cube until the **WHITE/ORANGE/BLUE** corner is directly below its intended position, at the bottom, right-hand corner of the cube.
- You may have to perform more than one $\frac{1}{4}$ turn permutation to get the corner underneath its intended position.
- Your cube should look like one of these pictures:



Lesson 2 Review

Vocabulary

Lesson Focus

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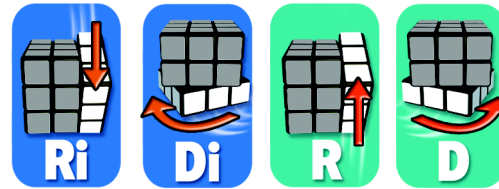
Lesson
Extension

Rubik's Trivia



To get the **WHITE/ORANGE/BLUE** corner in the correct position:

- With the **WHITE/ORANGE/BLUE** corner directly below its intended position, with the **ORANGE** face as the **RIGHT** face, do the following algorithm:



- Repeat the algorithm, (without turning the cube), until the **WHITE/ORANGE/BLUE** corner is in its correct position on the **TOP** layer.



PP13

- Position the **WHITE** face as the **UP** face.
- Position the **GREEN** face as the **RIGHT** face.
- Position the **ORANGE** face as the **FRONT** face.
- Find the **WHITE/GREEN/ORANGE** corner.
- If the **WHITE/GREEN/ORANGE** corner is on the **TOP** layer, move it to the **BOTTOM** layer.
 - Make a $\frac{1}{4}$ turn until the **WHITE/GREEN/ORANGE** corner piece is on the **BOTTOM** layer.
 - Twist the **DOWN** face a “D” turn.
 - Reverse the original $\frac{1}{4}$ turn back to the previous position.

To get the **WHITE/GREEN/ORANGE** corner in the correct position:

- Once the **WHITE/GREEN/ORANGE** corner piece is on the **BOTTOM** layer, twist the **DOWN** face of the cube until the **WHITE/GREEN/ORANGE** corner is directly below its intended position, at the bottom, right-hand corner of the cube.
- You may have to perform more than one $\frac{1}{4}$ turn permutation to get the corner underneath its intended position.
- Your cube should look like one of these pictures:



Lesson 2 Review

Vocabulary

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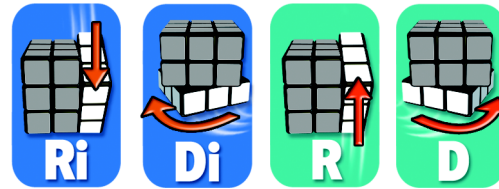
Lesson
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Rubik's Trivia



To get the **WHITE/GREEN/ORANGE** corner in the correct position:

- With the **WHITE/GREEN/ORANGE** corner directly below its intended position, with the **GREEN** face as the **RIGHT** face, do the following algorithm:



- Repeat the algorithm, without turning the cube, until the **WHITE/GREEN/ORANGE** corner is in its correct position on the **TOP** layer.



To get the **WHITE/RED/GREEN** corner in the correct position:

- Position the **WHITE** face as the **UP** face.
- Position the **RED** face as the **RIGHT** face.
- Position the **GREEN** face as the **FRONT** face.
- Find the **WHITE/RED/GREEN** corner.
- If the **WHITE/RED/GREEN** corner is on the **TOP** layer, move it to the **BOTTOM** layer.
 - Make a $\frac{1}{4}$ turn until the **WHITE/RED/GREEN** corner piece is on the **BOTTOM** layer.
 - Twist the **DOWN** face a “D” $\frac{1}{4}$ turn.
 - Reverse the original $\frac{1}{4}$ turn back to the previous position.
- Once the **WHITE/RED/GREEN** corner piece is on the **BOTTOM** layer, twist the **DOWN** face of the cube until the **WHITE/RED/GREEN** corner is directly below its intended position, at the bottom, right-hand corner of the cube.
- You may have to perform more than one $\frac{1}{4}$ turn permutation to get the corner underneath its intended position.
- Your cube should look like one of these pictures:



PP15

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Rubik's Trivia



To get the **WHITE/RED/GREEN** corner in the correct position:

- With the **WHITE/RED/GREEN** corner directly below its intended position, with the **RED** face as the **RIGHT** face, do the following algorithm:

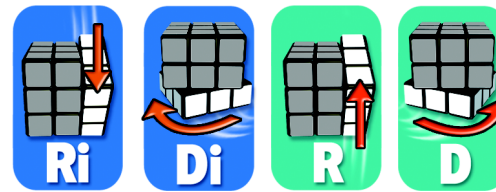


- Repeat the algorithm, without turning the cube, until the **WHITE/RED/GREEN** corner is in its correct position on the **TOP** layer.



If you accidentally place a **WHITE** corner with the incorrect face, reposition the **WHITE** corner on the **BOTTOM** layer underneath its intended position on the **TOP** layer and use the algorithm:

Troubleshooting

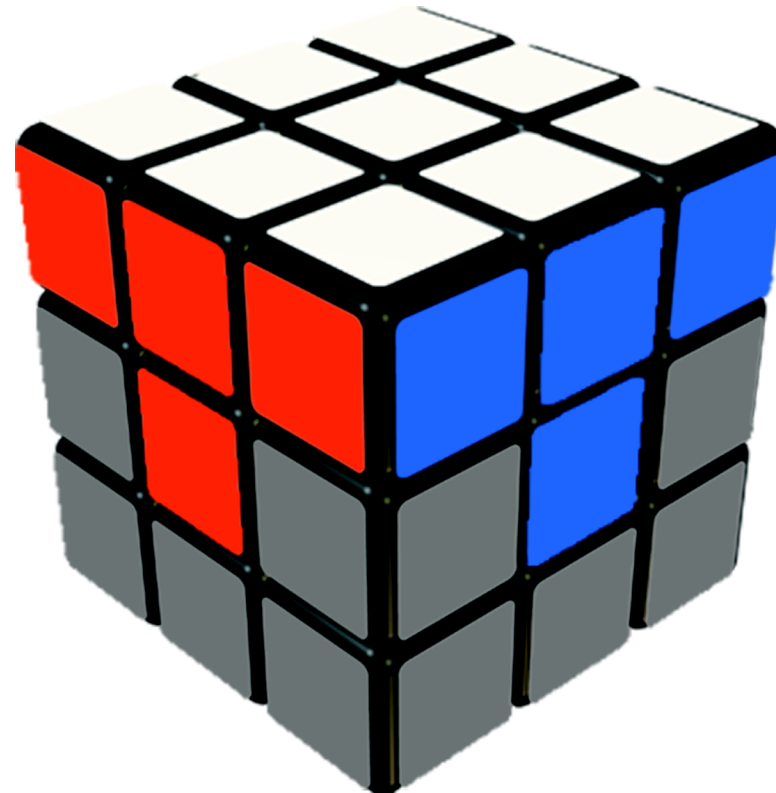


Make sure the **WHITE** cross remains intact each time you reposition a **WHITE** corner.



Examine your Rubik's Cube

PP18



GOAL: The **WHITE** Corners

The goal of this stage is to get the **WHITE** corners on the **UP** face with the **TOP** layer of each face matching the center piece.

Does your Rubik's Cube look like this?

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Rubik's Trivia



PP19

Congratulations!
Congratulations!
Congratulations!
Congratulations!
Congratulations!

You have achieved
The WHITE Corners

Lesson 2 Review

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Lesson Review

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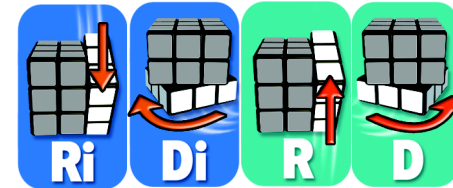
Rubik's Trivia



REVIEW

To get the **WHITE** corners matched with the correct faces:

- Position the **WHITE** face as the **UP** face.
- Position a **WHITE** corner on the **BOTTOM** layer underneath its intended position.



- Use the algorithm **Ri Di R D** as many times as needed until the corner is in the correct position.
- Repeat the steps for each **WHITE** corner until all four corners are in the correct positions.



Lesson Extension

How does this lesson apply to math?

$$\begin{array}{r}
 11.268 \\
 5 \overline{) 56.340} \\
 \underline{5} \\
 06 \\
 \underline{5} \\
 13 \\
 \underline{10} \\
 34 \\
 \underline{30} \\
 40 \\
 \underline{40} \\
 0
 \end{array}$$

Repeating the pattern or algorithm as many times as needed is similar to repeating the steps to solve a long division problem with decimals.

In this long division problem, every number was divided by the divisor (5) and the next number in the dividend (56.34) was brought down to make a new dividend.

When solving for the **WHITE** Corners, every bottom corner starts the same way.



The algorithm **Ri Di R D** is used to place the corner in the correct place.

With the next corner, the same algorithm is used to place that corner correctly.



**Question: Who produced the most expensive Rubik's Cube?
What was it called?**

Answer:

The most expensive Rubik's Cube was the Masterpiece Cube, produced by Diamond Cutters International in 1995. The actual size, fully-functional cube features 225 carats of amethyst, 25 carats of rubies, and 24 carats of emeralds, all set in 18-karat gold, and was valued at approximately 1.5 million US dollars.

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