



Solving the Yellow Cross Songs & Chants for Learning

Elementary



Purpose: The aim of this lesson is to make stage 5: Solving the Yellow Cross accessible to all elementary students through the use of a song.

Background: Students should have spent time solving the top and middle layers of the cube and should be comfortable solving those two layers in 3 minutes or less.

Opening: *Now we are going to solve the yellow cross. This algorithm can seem tricky at first, so we are going to learn a song to go with it. Is everyone familiar with this tune? (Hum the tune to The Mexican Hat Dance). We call this the 'Fururf' move and we will be putting the moves to this stage to that fun tune!*

Lesson: *Before we begin to solve the yellow cross, let's take a look at the patterns for these two algorithms. Display a poster with both sets of moves side-by-side (see pg. 4).*

Ask: *Which patterns are the same in both moves? (A: The first and last moves!)*

What else do you notice about the first and last moves? (A: They are both front face moves; the first is a right and the second is a left!)

What about other patterns within the first algorithm? (A: The second and third moves are mirror image moves of the fourth and fifth moves; the second and fourth moves are top moves, whereas the third and fifth moves are right moves).

What other patterns can you find in the second algorithm? (A: The second and third moves are also mirror image moves of the fourth and fifth moves; the second and fourth moves are right moves, whereas the third and fifth moves are top moves.)

Other than the first and last moves, how else are the first and second algorithms the same? How are they different? (A: The first algorithm pattern goes: Top Left, Right Up, Top Right, Right Down; whereas the second algorithm goes Right Up, Top Left, Right Down, Top Right.)

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Great work finding patterns! Now let's put the first algorithm to music:

F.U.R.U.R.F. Move (To the Mexican Hat Dance Tune)

Front Right

Top Left

Right Up (clap, clap)

Top Right

Right Down

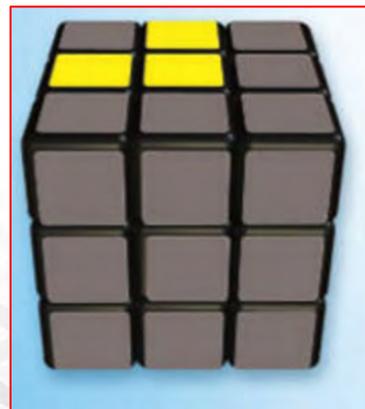
Front Left (clap, clap)

*repeat if needed

Two more notable patterns within this sequence are 1.) There are only two lefts within the algorithm. They happen at the 2nd and 6th moves. 2.) There are three 'moves' and then three 'undo', or opposite moves.

Note: The acronym F.U.R.U.R.F. stands for front, up, right, up, right, front. Thinking about the acronym seems to give the students (and teachers!) an extra layer of understanding in their memory banks.

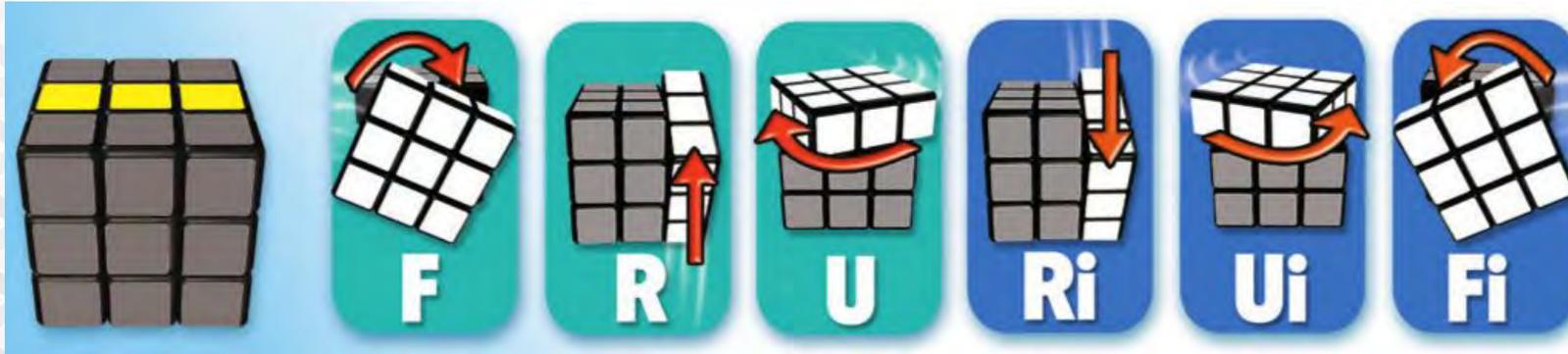
Now we need to know when to use the first algorithm. When you finish solving the middle layer, turn the cube so that the yellow center square is on top. If you have either just the yellow center on top, or a small yellow 'L' in the top left corner, you will complete the F.U.R.U.R.F. algorithm to solve the cube (see the above song). You may have to complete the sequence more than once to get the yellow cross.



If, however, you have a yellow 'belt' across the cube, you will complete the second algorithm, or sequence of moves, to solve for the yellow cross. Instead of F.U.R.U.R.F., your move will be F.R.U.R.U.F.! The song will be the same, but the lyrics will change slightly:

F.R.U.R.U.F. (when you have a yellow 'belt')

Front Right
Right Up
Top Left (clap, clap)
Right Down
Top Right
Front Left (clap, clap)
*repeat



Practice: Give students the opportunity to practice the move until they've solved the yellow cross. Have extra cubes on-hand that are solved through the middle layer to provide ample practice time for students.

Independent Practice: Have students practice the moves through the yellow cross five times daily for one week. Provide lyrics for students to take home to practice, and make sure students have access to the training video. Once students have mastered the steps through the yellow cross in 3 minutes, they will be ready to go onto the next stage.

YouTube links:

Entire playlist: <http://tinyurl.com/ElemVideos>

Video for this lesson:

<https://youtu.be/M8afNuq-0rY>

FUR-URF

vs

FRU-RUF

Front Right

Up (Top) Left

Right Up

Up (Top) Right

Right Down

Front Left

Front Right

Right Up

Up (Top) Left

Right Down

Up (Top) Right

Front Left





Solving the Last Layer- All yellow on top Songs & Chants for Learning

Elementary



Purpose: The aim of this lesson is to make solving stage 5, part 2 (yellow corners) of the Rubik's Cube accessible to all elementary students through the use of a chant and kinesthetic hand movements.

Background: Students should be able to solve the cube through the beginning of stage 5 (the yellow cross) in three minutes or less before moving onto this stage.

Opening: *You've learned so many steps to solve the Rubik's Cube. Would you believe you know 45 steps so far? Which stage has been the most challenging to learn so far? Which stage has been easiest? While I'm so proud of each of you for your perseverance during the challenging stages and steps of the Cube, I think you all deserve a break today! How does that sound?*

Lesson: *We call this 'The Easy Peasy Move', because students find this to be the easiest step in the solve. We have a fun song for this move, and I think you'll soon understand why students breathe a sigh of relief and just enjoy the ease with which they are able to complete 'The Easy Peasy Move'*

The Easy Peasy Move (Yellow Corners on Top)

Right Up
Top Left
Right Down
Top Left
Right Up
Top Left
Top Left
Right Down

See the
[video](#) for the
coordinating
tune.

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Look for patterns within the move: Every other move is a right, except the two top lefts toward the end. The top face of the cube is only moved to the left during this move. The right pattern is up, down, up, down.

Now that you've become familiar with the patterns, can you see why students find this move to be so simple? Before we solve this move, we need to know one more trick: how to hold our cube when completing this move. There will be three ways to hold the cube, depending upon the pattern on the top. If no corners are on the top face of the cube, you'll put your yellow pointer finger on a yellow tile on the left side (See the book for illustration). If one corner cube is on top, you'll see that it looks like a yellow fish. In that case, have the yellow 'fish' eat out of your left palm before starting the move. If any two corners of the cube are yellow, place your left thumb on a yellow piece of the cube (see the book for illustration).

Now that you've matched your top face to one of the above states, perform the 'easy' move. After each sequence, orient the cube to rematch the top face to the appropriate state and repeat the sequence until all four top corners are yellow.



Extension: After experiencing the success of this move, students will feel encouraged. Have them channel that positive energy into a letter to their future selves.

Example: Dear Future Me, I'm writing to encourage you to persevere during the final steps of the cube. You are so close to solving this! Don't quit now. You can do this. Think of how many steps you've already learned. Don't be discouraged. You will soon experience the ultimate success. Just don't give up! Love, Your Past (and Super Successful) Self

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YouTube links:

Entire playlist: <http://tinyurl.com/ElemVideos>

Video for this lesson:

<https://youtu.be/tMB9THEzCog>