HAPPY TILES

ACTIVITY GUIDE

TABLE OF CONTENTS

Julia Robinson Mathematics Festival

Materials and Setup

Per table (assuming 5 students per table), you will need:

Per Table	**Material Preparation**	
5 Pentomino sets	Each set has 12 unique pieces.	
3 copies of Instructions	1 page each	p. 7
5 copies of Puzzle Pieces Sheet	2 pages each *print single-sided* *(students need to be able to use both pages simultaneously.)*	p. 8-9
5 copies of Tasks	10 pages each *can be printed double-sided*	p. 10-19
1 copy of Table Sign	1 page *print on cardstock for sturdiness*	p. 20

Per Table	**Purchasing Materials**		
5 pentomino sets	6 pentomino sets for $24.13		
28 plastic sheet protectors	pack of 100 for $7.67	pack of 500 for $26.99	These are recommended in order to protect the documents that students will be handling.

Objective

Place some of the pentominoes on the puzzle.

1. Cover all of the sad faces.
2. Don't cover any of the happy faces.
3. You don't have to cover every square.

Materials

Each Happy Tiles table should be prepped for 5 stations.
Each station needs:

1. Pentomino set (12 distinct shapes).
2. Happy Tiles puzzle pieces sheets.
3. Happy Tiles instructions.
4. Happy Tiles tasks.

How to Play

We strongly encourage you to explore the activity yourself ahead of time.
You can try our online version here.

Introduce the activity without overexplaining it and without telling what strategies students might want to use. As much as possible, avoid giving away answers. Students should be encouraged to explore, experiment, and learn from their mistakes.

1. Demonstrate the rules by starting the first puzzle with them.
2. Have the student solve the first puzzle and then explore the next puzzles.

Standards

1. Make sense of problems and persevere in solving them. CCSS.MP1
2. Construct viable arguments and critique the reasoning of others. CCSS.MP3
3. Model with mathematics. CCSS.MP4
4. Look for and make use of structure. CCSS.MP7

Asking Good Questions

1. Ask questions about confidence.
    a. When a student asks you “Is this right?”, instead of saying “yes” or “no” right away, ask them how confident they are in their answer. Here are some examples:
        i. “Maybe. What do you think? How confident are you?”
        ii. “On a scale of 1-5, how confident are you in your answer?”
    b. If a student is not confident in their answer, follow up by asking “What would help you feel more confident in your answer?” or “Why do you not feel confident?” This helps you determine how best to help the student through their explorations.

2. Ask students about choices.
    a. When a student is stuck or shows you a wrong answer, instead of jumping in and showing the student the correct answer, start by asking about the choices that the student made along the way. Here are some suggested steps to follow:
        i. Start from the beginning.
        ii. Ask students to show you what they’ve tried so far.
        iii. When the student gets to a point where they have different choices, ask the student “What other choices can you make here?”
        iv. Have the student make a different choice and try to solve the puzzle. This helps the student see that they have the power to make different choices during an activity, and they’ll start to do this on their own in the future.
        v. If you’re familiar with the puzzle or a particular solution, stop the student only when a different choice will help them get to the solution. This will help them feel successful faster without you giving away too much of the answer.

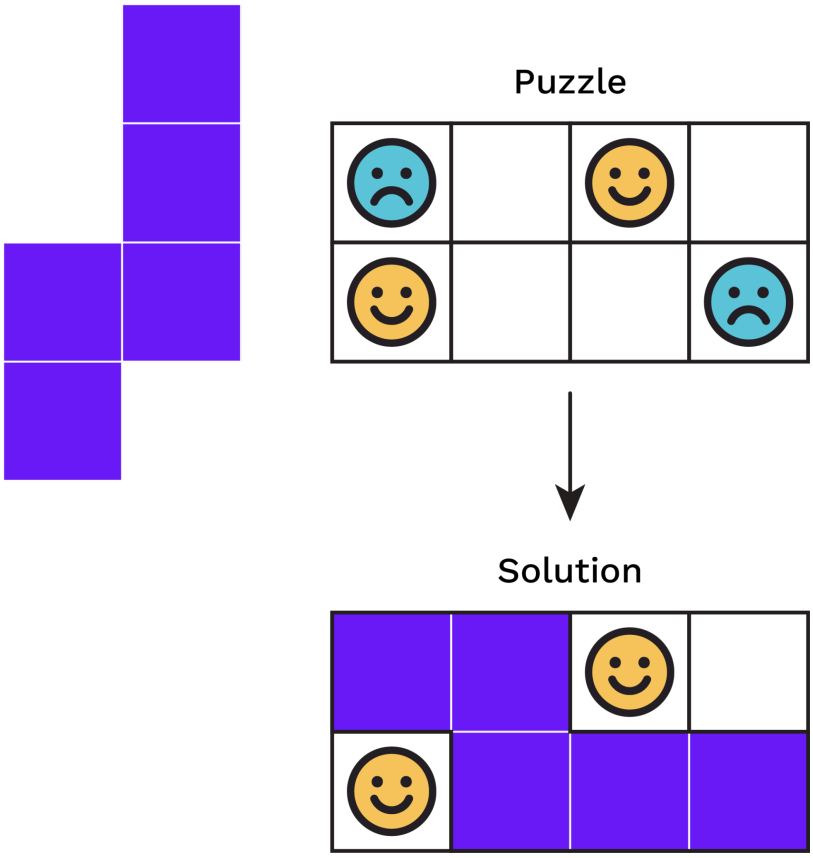
3. Ask students about strategies.
    a. If a student is getting into the activity and has been doing it for a while, ask the student if there are any strategies they’ve come up with to help them solve the puzzle or win the game.
    b. Follow up by asking if they think their strategies will work for all puzzles and/or larger puzzles, more complex puzzles, etc. Have the student explore more complex puzzles to test out their strategies.
    c. This is a great way to encourage a student to dive deeper into an activity and to start looking for patterns, structure, and proofs.

Julia Robinson Mathematics Festival®

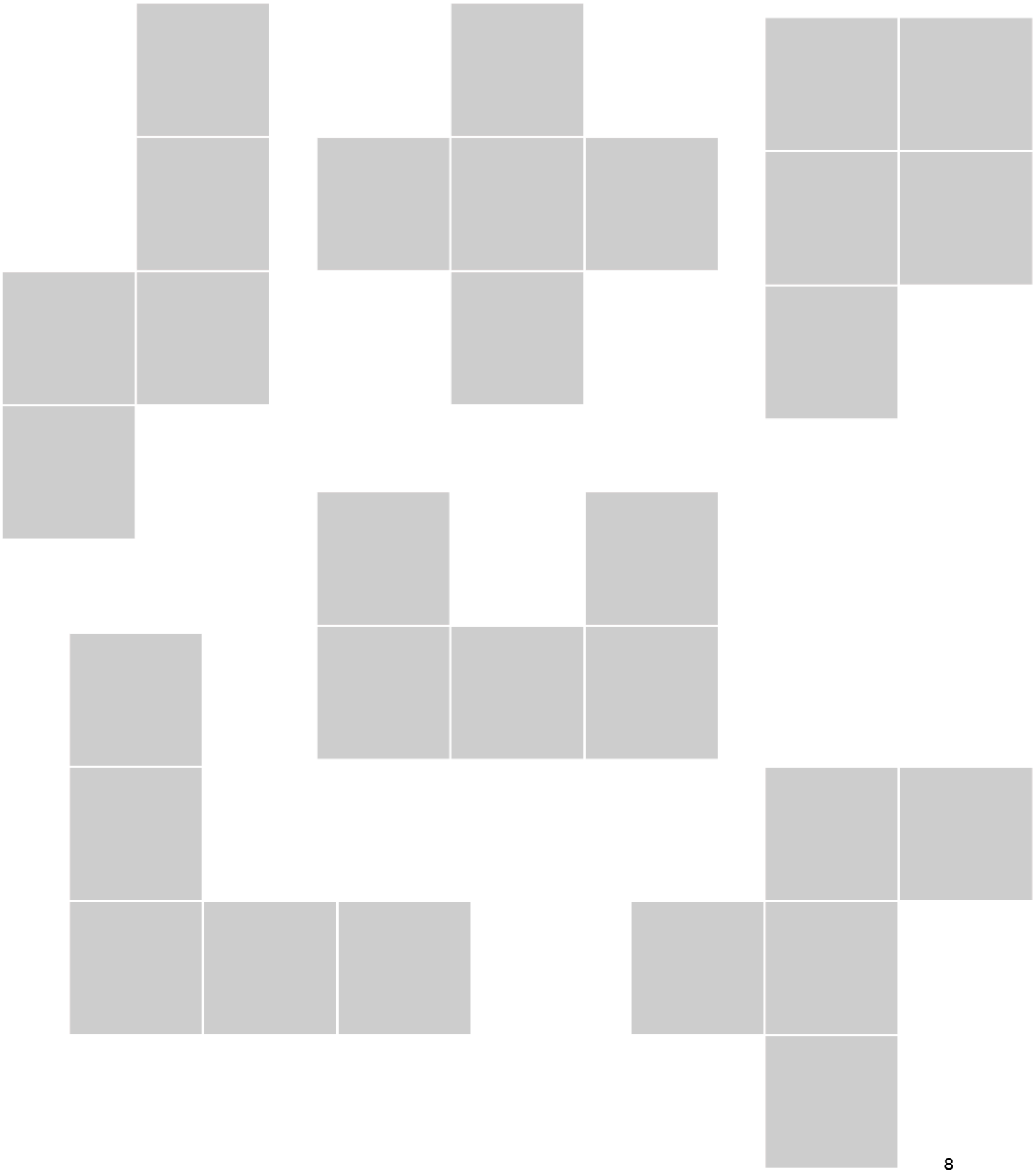
Happy Tiles Instructions

Rules:

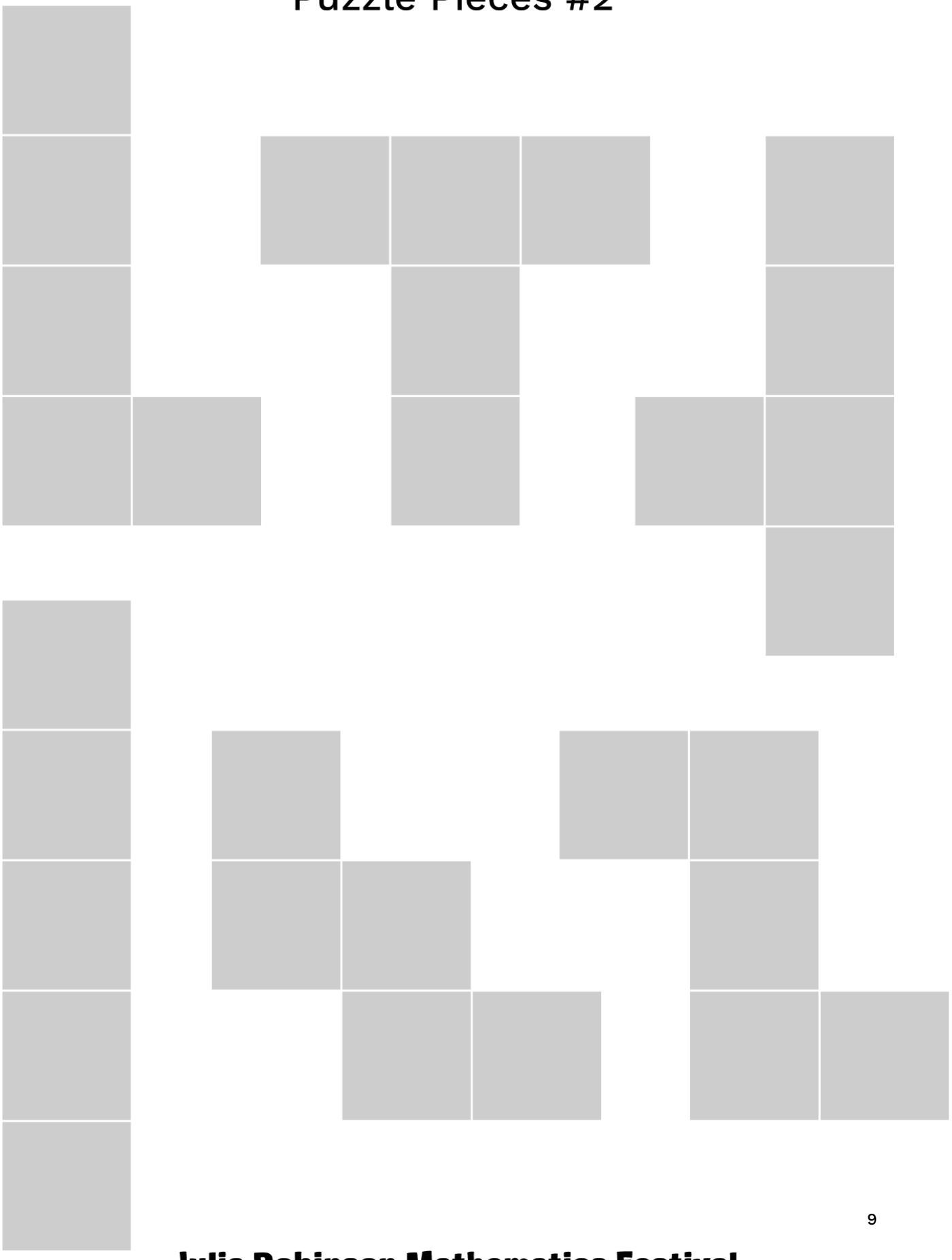
- Cover all of the sad faces.
- Don’t cover any of the happy faces.



Happy Tiles
Puzzle Pieces #1

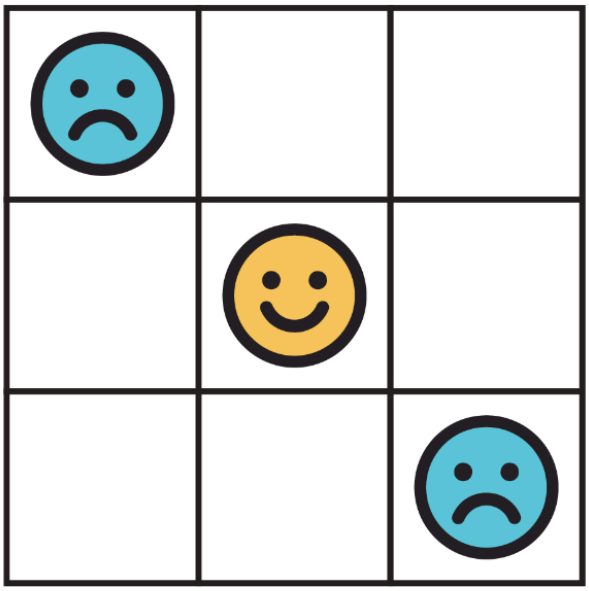


Happy Tiles
Puzzle Pieces #2

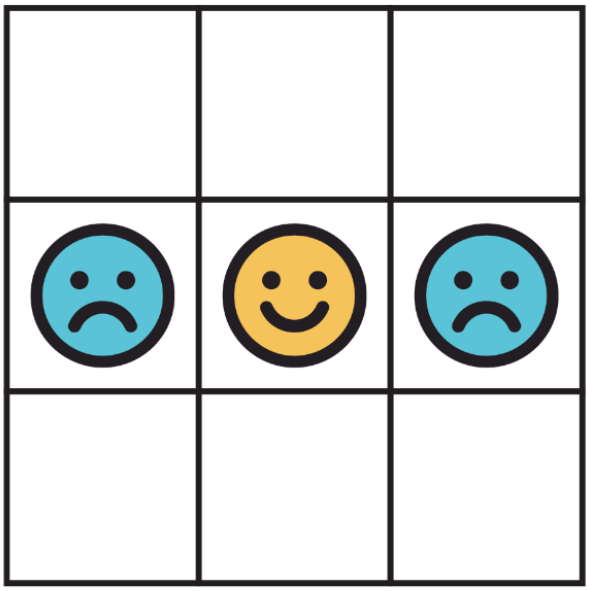


Happy Tiles

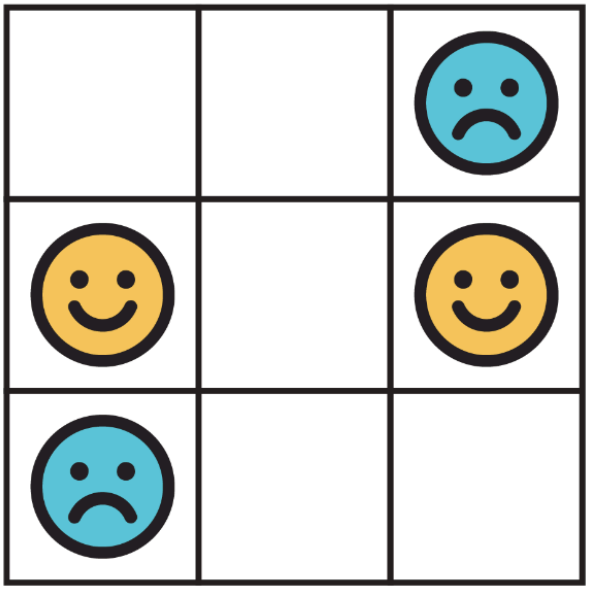
Puzzle 1



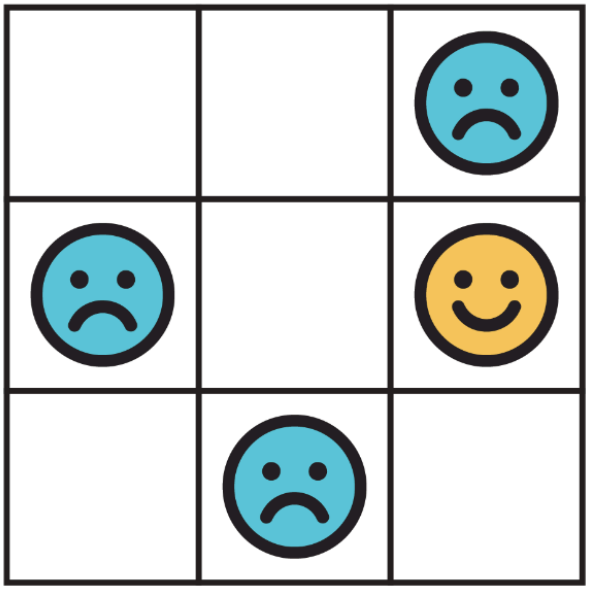
Puzzle 2



Puzzle 3

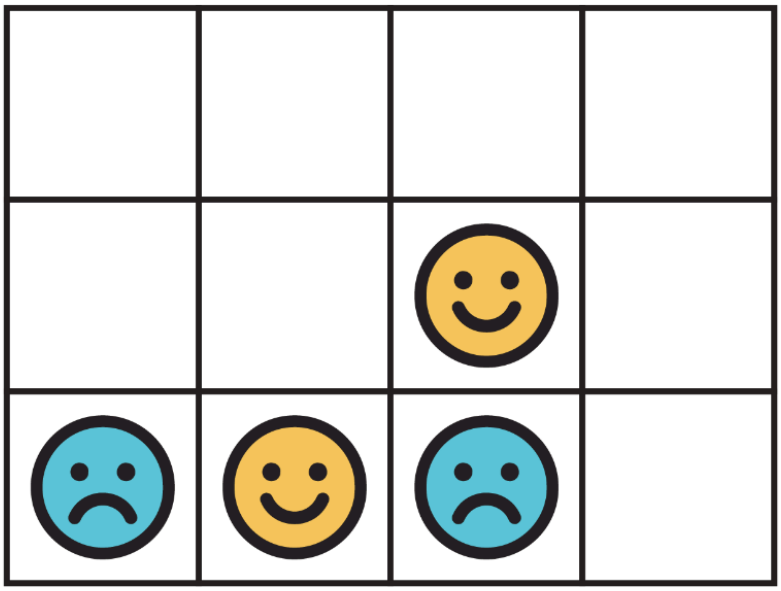


Puzzle 4

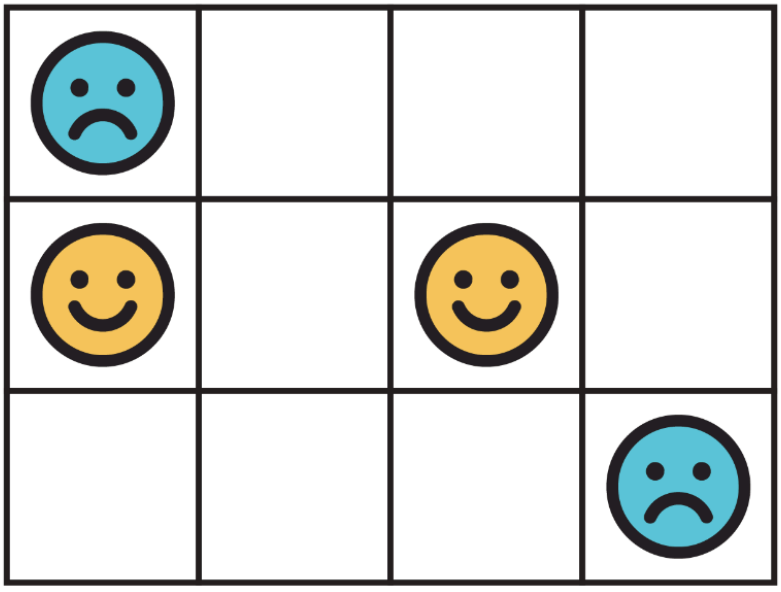


Happy Tiles

Puzzle 5

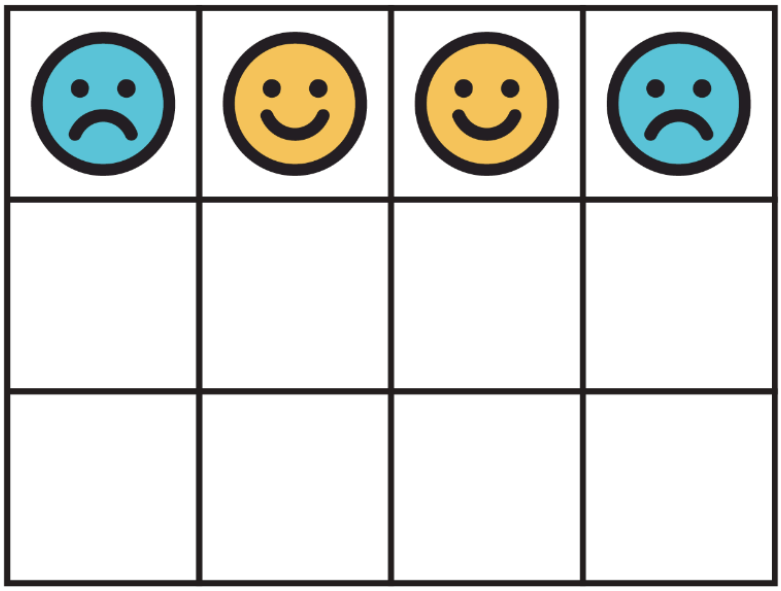


Puzzle 6

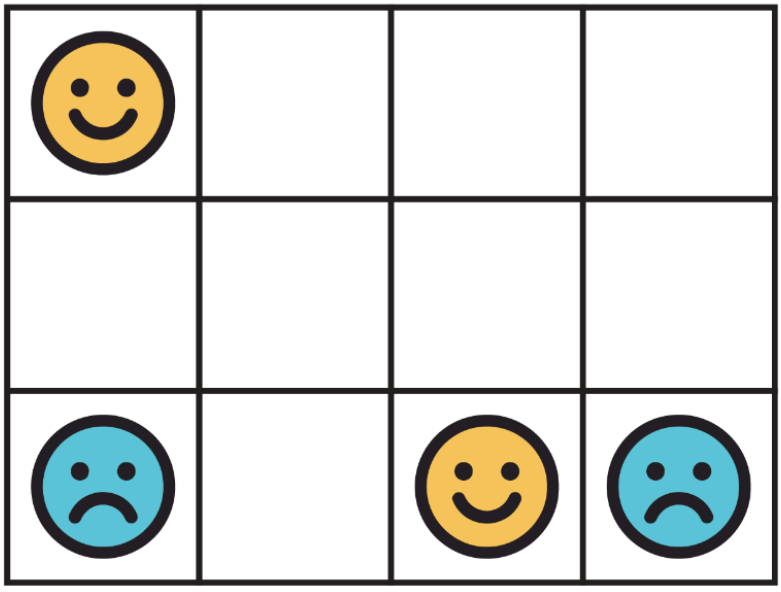


Happy Tiles

Puzzle 7

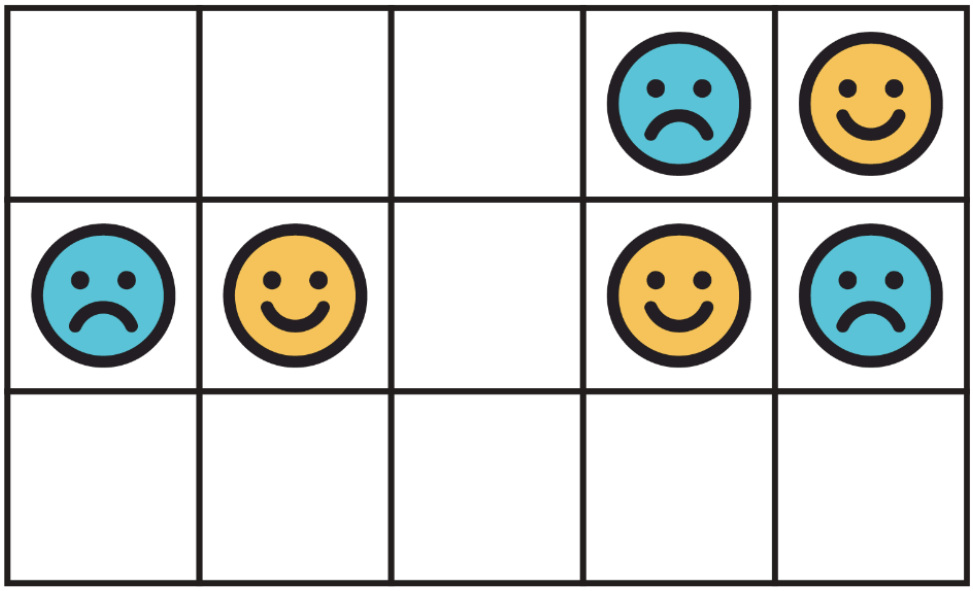


Puzzle 8

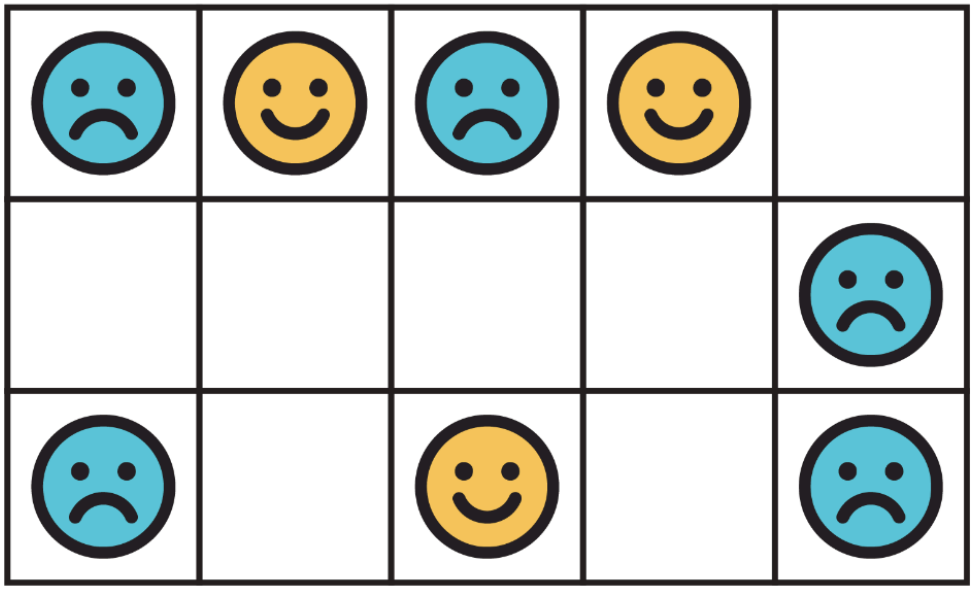


Happy Tiles

Puzzle 9

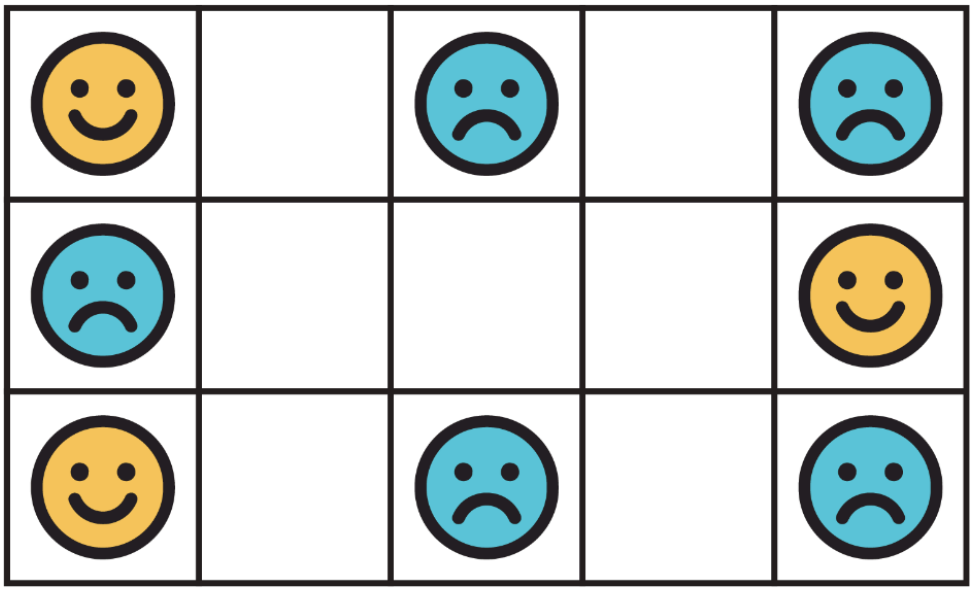


Puzzle 10

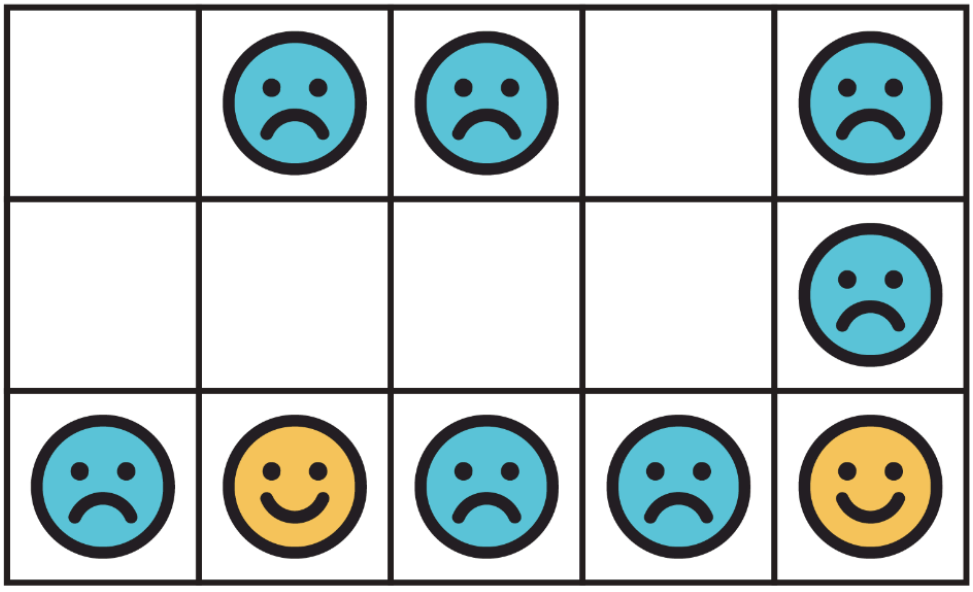


Happy Tiles

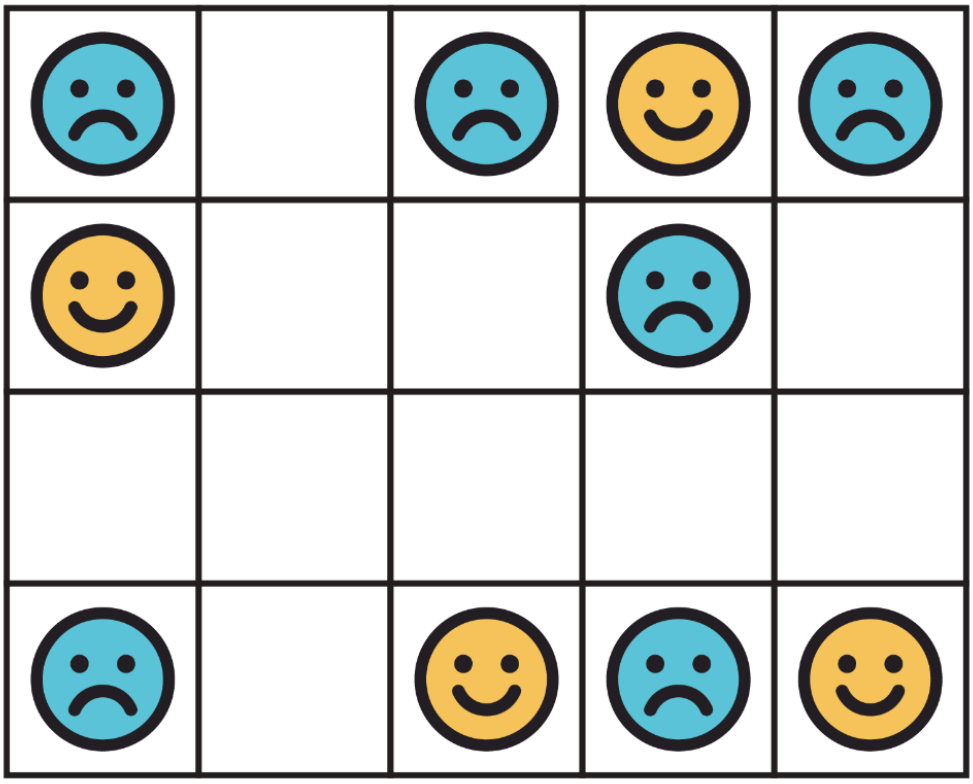
Puzzle 11



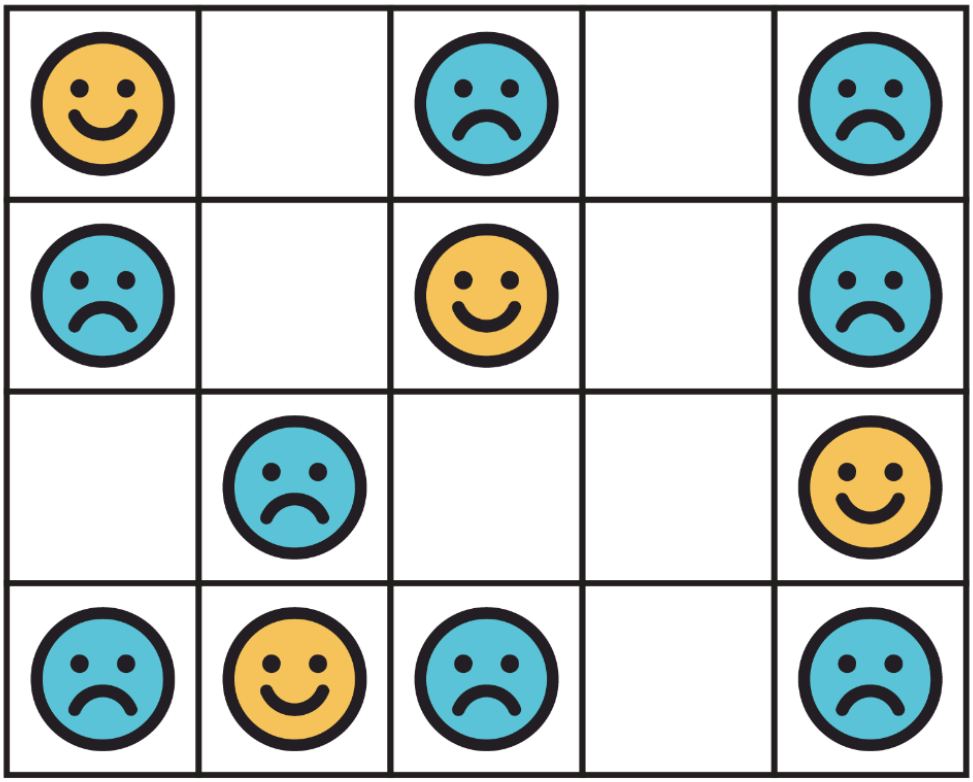
Puzzle 12



Happy Tiles

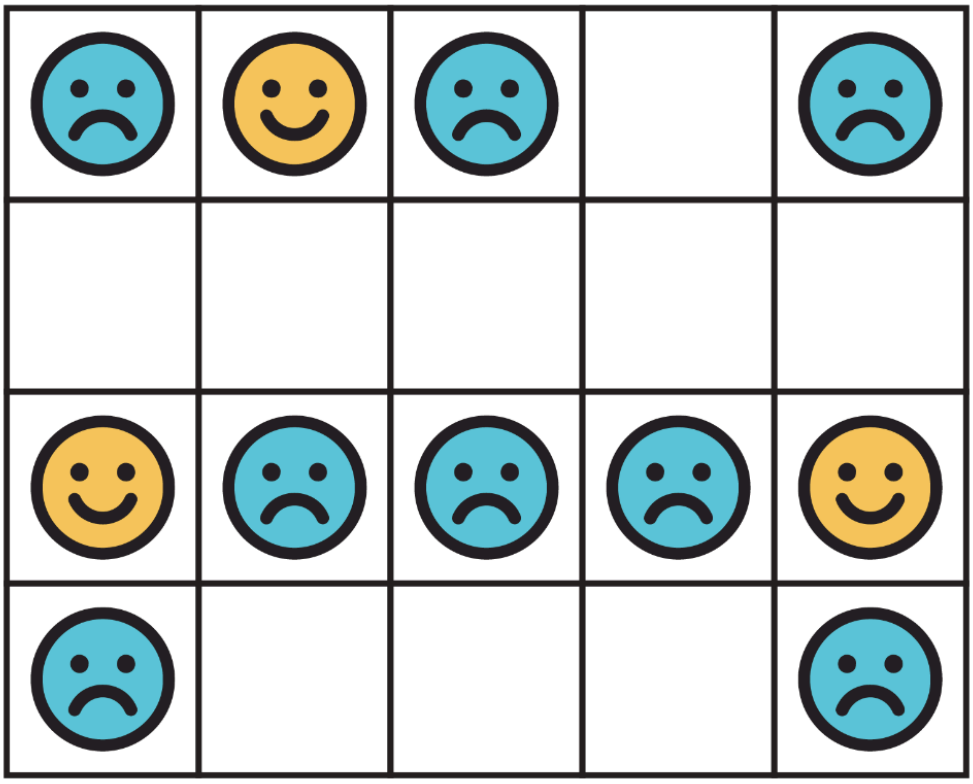


Puzzle 13

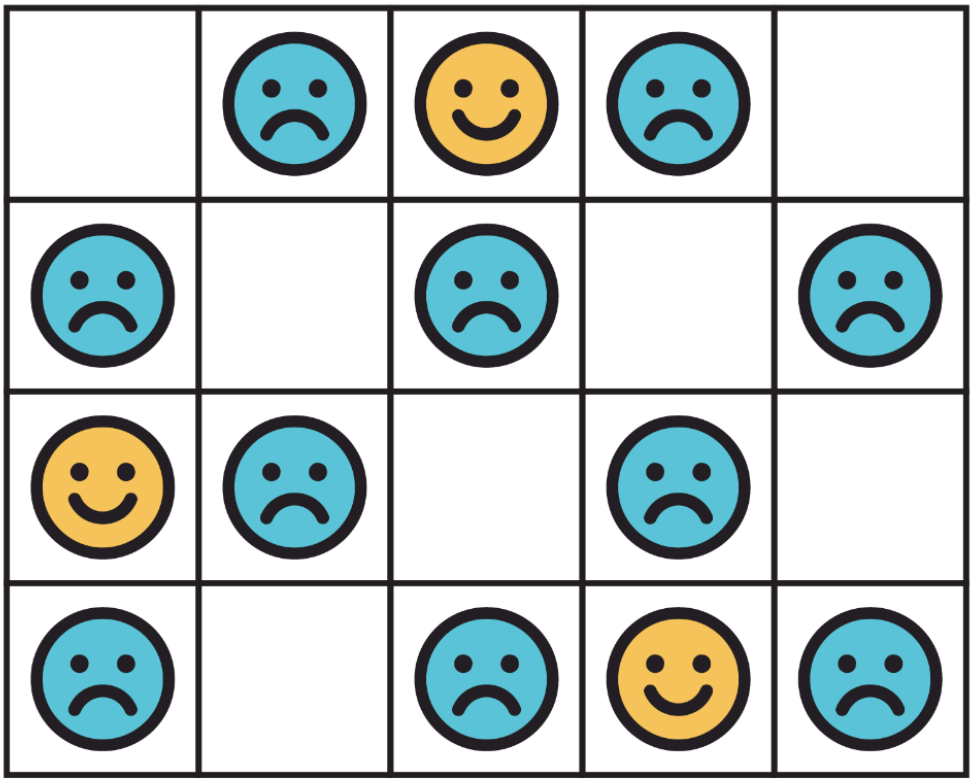


Puzzle 14

Happy Tiles



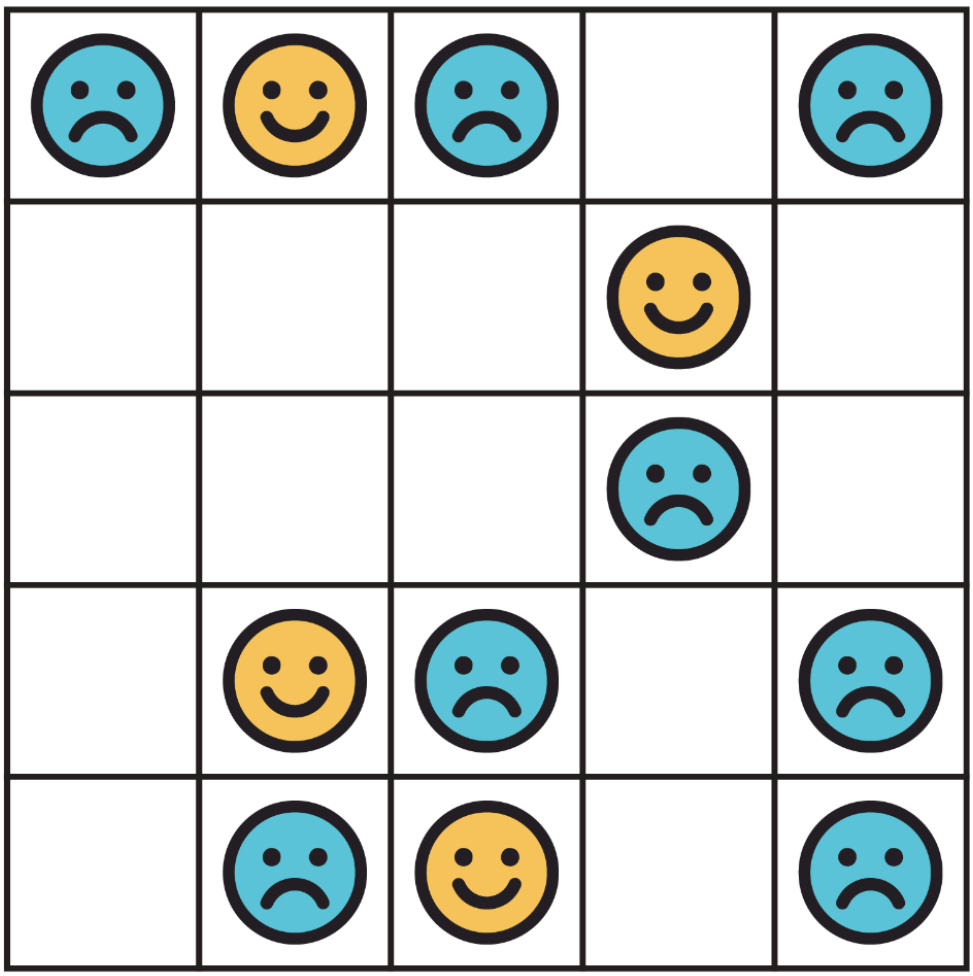
Puzzle 15



Puzzle 16

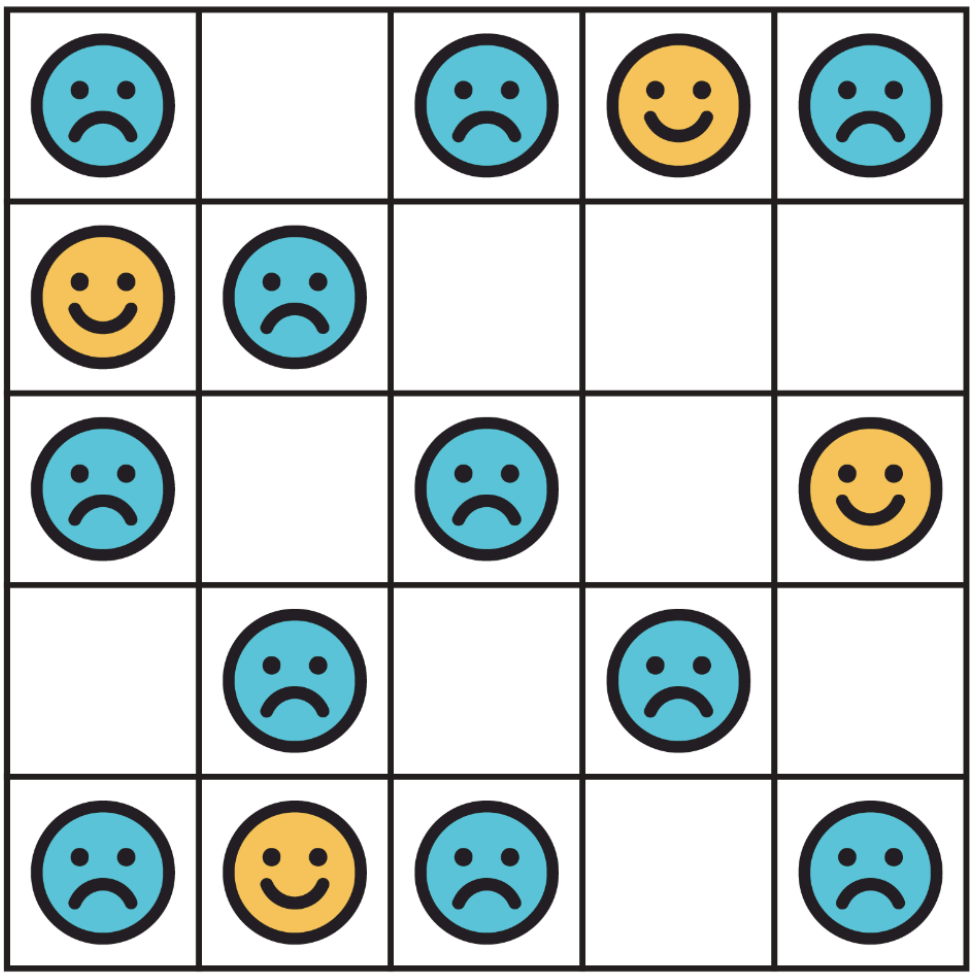
Happy Tiles

Puzzle 17



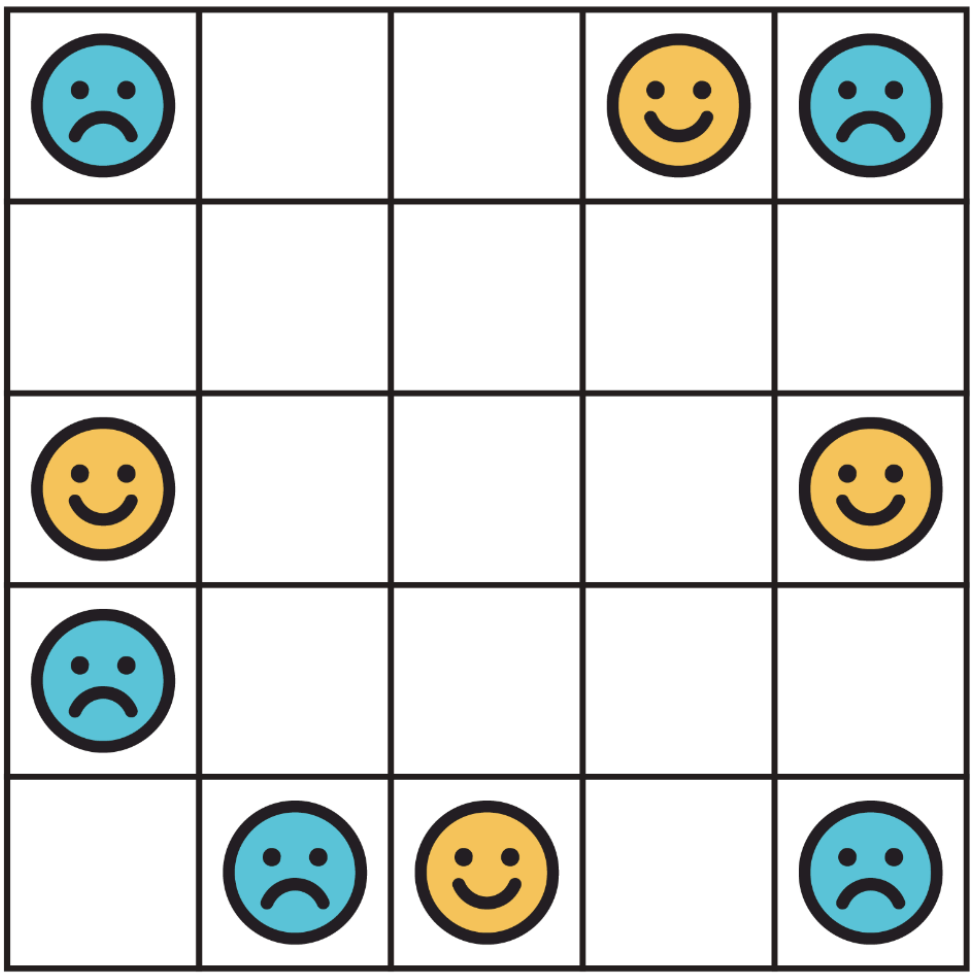
Happy Tiles

Puzzle 18



Happy Tiles

Puzzle 19



Play for free at
jrmf.org/puzzle/happy-tiles

HAPPY TILES

HAPPY TILES

Play for free at
jrmf.org/puzzle/happy-tiles