

WOLVES AND SHEEP

FESTIVAL GUIDE

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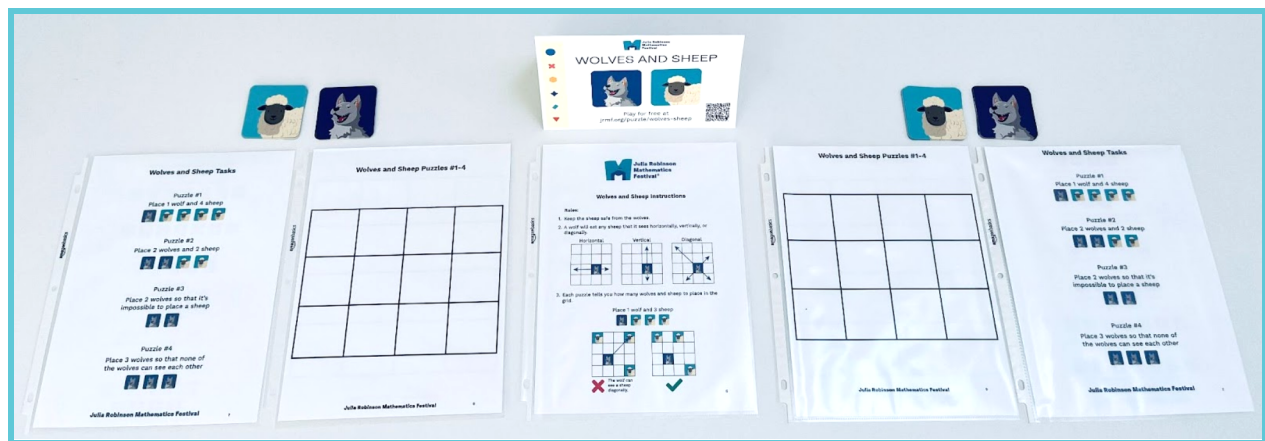
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Mathematics
Festival**

Materials and Setup

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

Per Table	Material Preparation	
3 copies of Instructions	2-page sheet <i>can be printed double-sided</i>	p. 6
5 copies Tasks	2-page sheet <i>can be printed double-sided</i>	P. 8-9
5 copies of Grids	2-page sheet <i>can be printed double-sided</i>	p. 10-11
50 Wolves and Sheep Cards	Print double-sided and then cut out.	p. 12-13
1 copy of Table Sign	1-page sheet <i>print on cardstock for sturdiness</i>	p. 14

Per Table	Purchasing Materials		
13 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 all the given numbers of wolves and sheep into the grid.

Rules:

1. Keep the sheep safe from the wolves.
2. A wolf will eat any sheep that it sees horizontally, vertically, or diagonally.

Materials

Each Wolves and Sheep table should be prepped for 5 stations.

Each station needs:

1. 10 Wolves and Sheep cards.
2. Wolves and Sheep instructions.
3. Wolves and Sheep grids and tasks.

How to Play

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. Use the 4 x 3 grid to demonstrate the wolf's line of sight. Place a wolf on the grid and have the student indicate which spots would be dangerous for a sheep and which would be safe.
2. Start the first challenge with them. Encourage them to explain their thinking out loud as they choose which move to make.
3. Have the student try the explorations on the 4 x 3 grid.

Addressing Misconceptions

This section is based on the most common mistake we've seen while students play Wolves and Sheep. Showing a clear example before students begin the activity may help avoid this misconception, but you also want to make sure you are addressing this misunderstanding while students are playing.

Here is the rule that often needs to be reinforced:

1. A wolf will eat any sheep that it sees horizontally, vertically, or diagonally. Students often think that a wolf can only eat a sheep that is right next to it.

Exploring with Younger Children

To make the activity more accessible for younger or struggling students:

Remove a rule:

- Disregard the rule about diagonal and focus just on wolves eating sheep they see in the same row or column.

Change the activity:

- Disregard all the rules and the task sheets.
 - Have the students place one card in each square and then count each card.

Standards

1. Make sense of problems and persevere in solving them. CCSS.MP1
2. Model with mathematics. CCSS.MP4
3. Attend to precision. CCSS.MP6
4. Look for and express regularity in repeated reasoning. CCSS.MATH.PRACTICE.MP8



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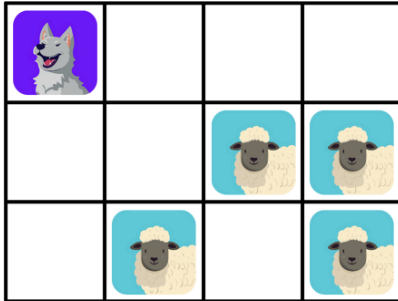
Asking Good Questions

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.

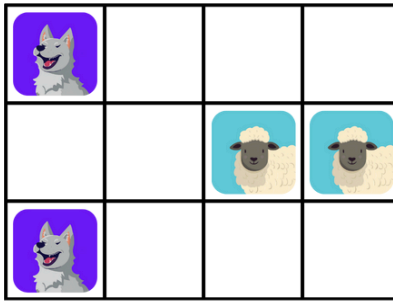
Answers

Some puzzles have more than one solution, so answers may vary.

Puzzle 1



Puzzle 2



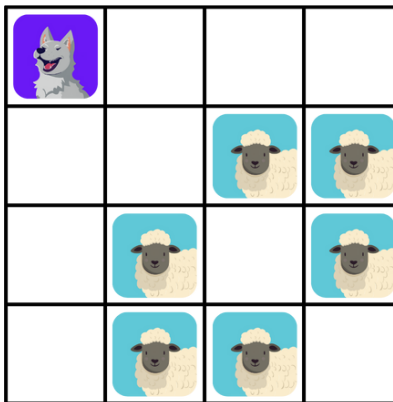
Puzzle 3



Puzzle 4



Puzzle 5



Puzzle 6



Puzzle 7



Puzzle 8



Puzzle 9



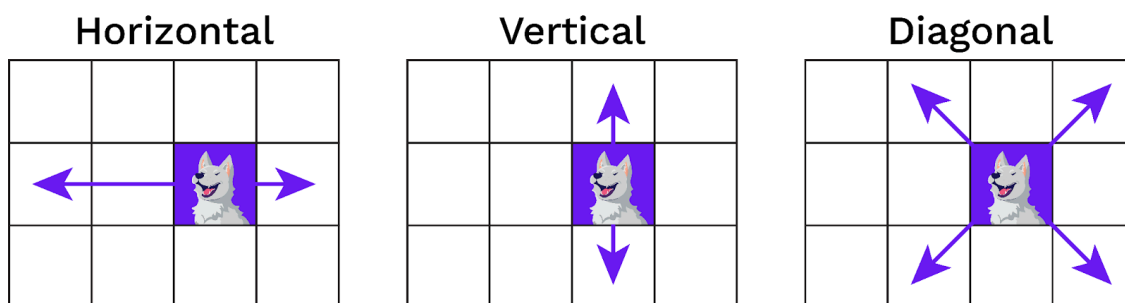
Puzzle 10



Wolves and Sheep Instructions

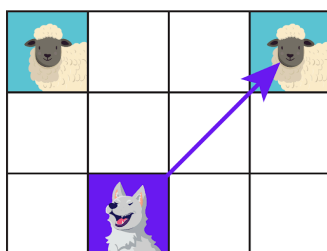
Rules:

1. Keep the sheep safe from the wolves.
2. A wolf will eat any sheep that it sees horizontally, vertically, or diagonally.



3. Each puzzle tells you how many wolves and sheep to place in the grid.

Place 1 wolf and 2 sheep



The wolf can see a sheep diagonally.



Wolves and Sheep Tasks

Puzzle #1

Place 1 wolf and 4 sheep



Puzzle #2

Place 2 wolves and 2 sheep



Puzzle #3

Place 2 wolves so that it's impossible to place a sheep



Puzzle #4

Place 3 wolves so that none of the wolves can see each other



Wolves and Sheep Tasks

Puzzle #5

Place 1 wolf and 6 sheep



Puzzle #6

Place 6 wolves and 1 sheep



Puzzle #7

Place 2 wolves and 3 sheep



Puzzle #8

Place 3 wolves and 2 sheep



Puzzle #9

Place 2 wolves so that it's impossible to place a sheep



Puzzle #10

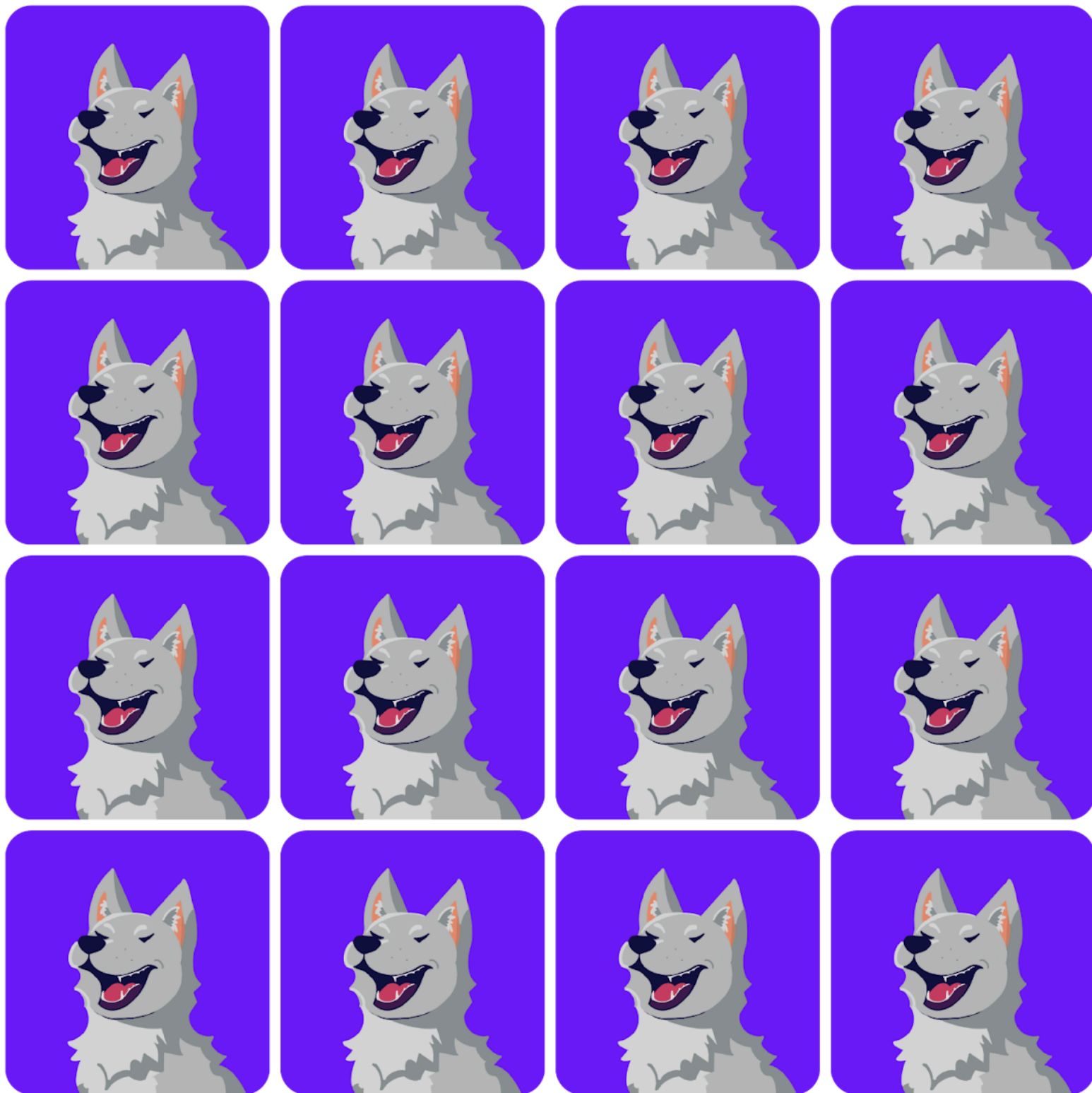
Place 4 wolves so that none of the wolves can see each other



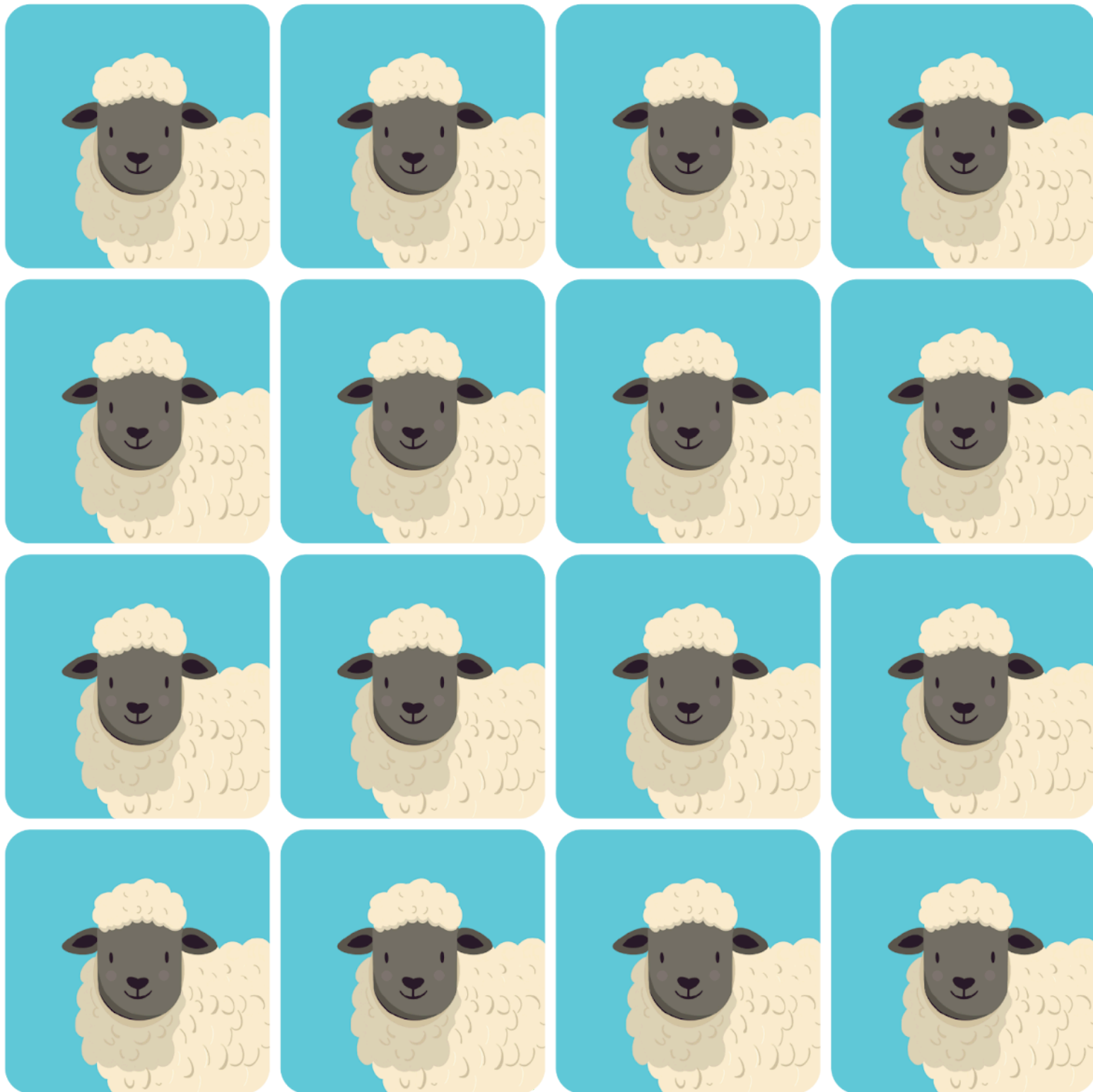
Wolves and Sheep Puzzles #1-4

Wolves and Sheep Puzzles #5-10

Wolf Cards



Sheep Cards





Play for free at
jrmf.org/puzzle/wolves-sheep



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Play for free at
jrmf.org/puzzle/wolves-sheep

