

Chameleon Island



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Mathematics
Festival**



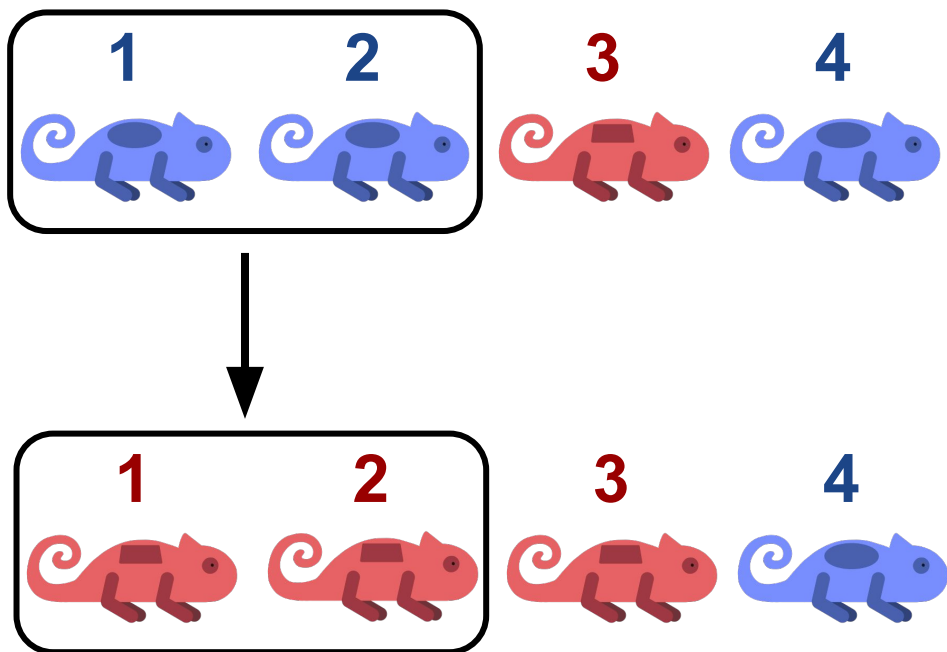
App

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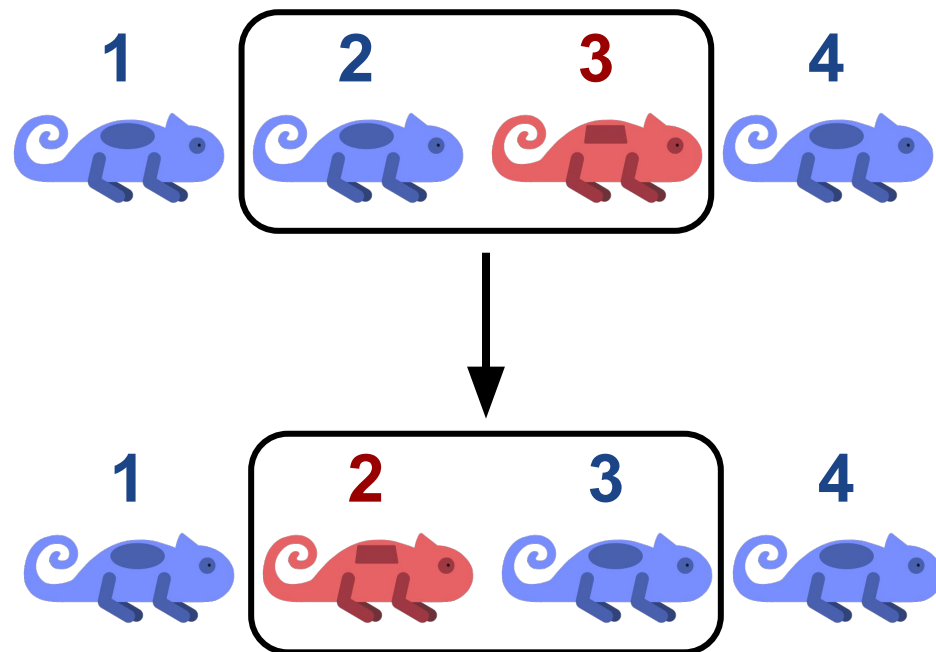
Chameleon Island

On Chameleon Island, chameleons come in one of two colors: red or blue. It's a big island, so chameleons only meet with other chameleons that are right next to them. When two chameleons meet, they both change colors, like this:

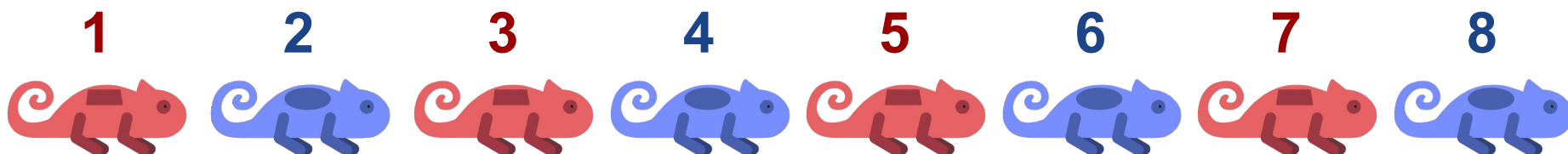
If Chameleon 1 and Chameleon 2 meet, both chameleons will turn red.



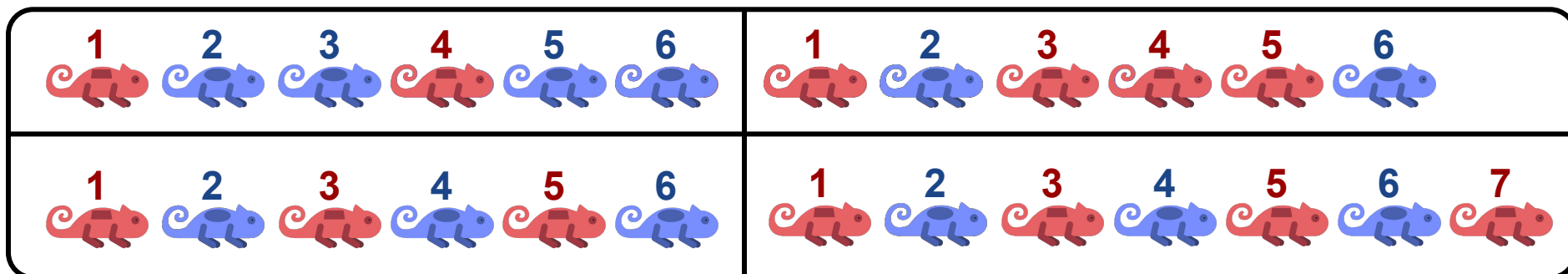
If Chameleon 2 and Chameleon 3 meet, Chameleon 2 will turn red and Chameleon 3 will turn blue.



- One day, there are 4 red and 4 blue chameleons on Chameleon Island in a line like below. After some time passes, is it possible for every chameleon to become the same color? If so, how? If not, why not?



- What about for these other situations?



- Try some other starting numbers and color combinations of chameleons. Can you predict when it's possible for all the chameleons to become the same color?



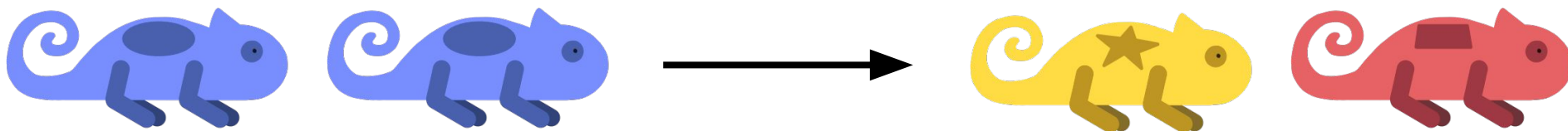
Chameleon Tourists

Some chameleon tourists are visiting Chameleon Island. There are now three different colors of chameleon: red, blue, and yellow. Any two chameleons can now meet, not just those that are next to each other. When two chameleons meet, they change color according to the following rule:

- Two different-colored chameleons will both change to the third different color.



- Two same-colored chameleons will change to one of each of the other two colors.



More Explorations

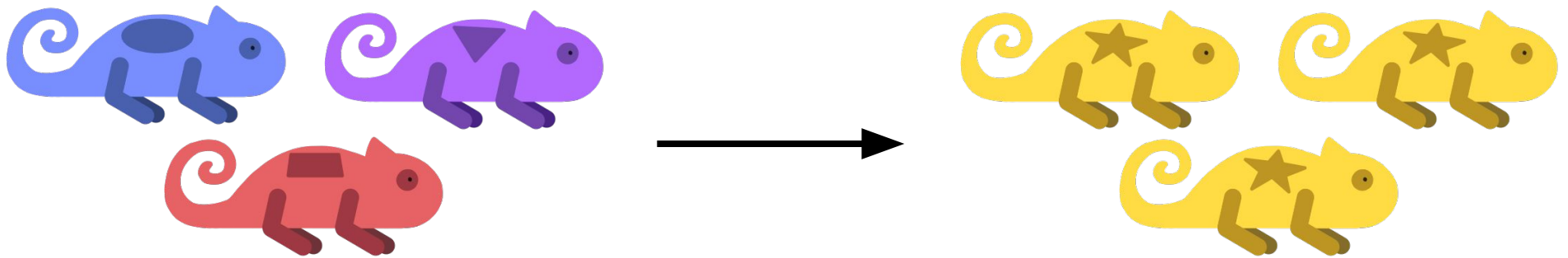
1. One day, there are 2 blue, 5 red, and 8 yellow chameleons on Chameleon Island. After some time passes, is it possible for every chameleon to become the same color? If so, how? If not, why not?
2. What if there are 2 blue, 3 red, and 5 yellow chameleons?
3. What if there are 2 blue, 3 red, and 4 yellow chameleons?
4. Try some other starting numbers of chameleons. Can you predict when it's possible for all the chameleons to become the same color?
5. For the situations above that are possible, is it possible for all of the chameleons to become each of the three different colors? If so, how? If not, why not?



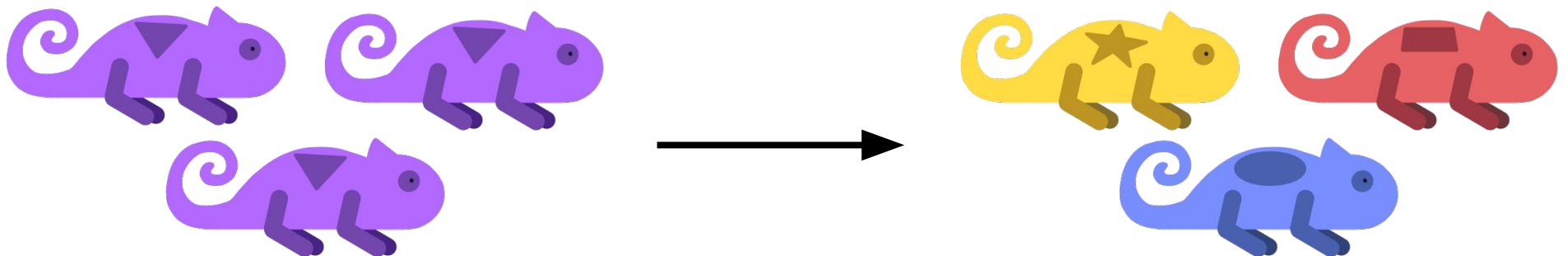
More Tourists

Some more chameleon tourists are visiting Chameleon Island. There are now four different colors of chameleon: red, blue, yellow, and purple. When three chameleons meet, they change color according to these rules:

- Three different-colored chameleons will all change to the fourth different color.



- Three same-colored chameleons will change to each of the other three colors.



Extensions

1. One day, there are 2 blue, 6 red, 8 yellow, and 10 purple chameleons on Chameleon Island. After some time passes, is it possible for every chameleon to become the same color? If so, how? If not, why not?
2. What if there are 2 blue, 4 red, 6 yellow, and 8 purple chameleons?
3. Try some other starting numbers of chameleons. Can you predict when it's possible for all the chameleons to become the same color?
3. When is it possible for all of the chameleons to become each of the four colors?
4. How could you change the rules on Chameleon Island to create other interesting puzzles?

