Lesson Printables

Be a rockstar and only print what you need!

Planners: 2-3

Picture Prompts
Sunlight: 4
Twilight: 5
Midnight: 6

Extras
Optional Recording Logs: 7
Sunlight Answers: 8
Twilight Answers: 9
Midnight Answers: 10

**Printing in the US? Scale to 'fit to printable area' in order to get the best print.*

LESSON 1: Ratio/Proportion - Intro to ratio vocabulary and the ratio symbol

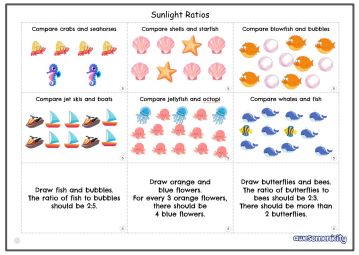
Starter	Main Activity and Input: Using pictures to identify the ratio between objects.	Plenary
Brolly Problem: The numbers on each umbrella are connected in some way. Can students work out the connection and fill in the missing numbers? (Diagonals are connected through addition or multiplication.) **To support:** 1. Draw a diagonal line between connecting numbers (see solution slide) to show students which numbers are connected to each other. **To challenge:** 1. Students could draw a new umbrella problem of their own for someone else to solve.	**Input:** 1. Slide 6 shows some red and orange starfish. What do students notice? How many different observations can students make? There are no wrong answers, this is an opportunity to see what students observe. 2. Slide 7 explains that the fish wants to focus on the *ratio* between the different colours. We have defined ratio as a comparison between 2 or more things. What could students compare between the starfish? Slide 8 introduces ratio vocabulary by saying that for every 3 red starfish, there is 1 orange starfish. It also introduces the ratio symbol to show the comparison can be written as 3:1. Is there another way students could compare the starfish? Slide 9 explains that for every 1 orange starfish, there are 3 red starfish. This can be written as 1:3. 3. Slide 10 introduces a new picture of balloons and presents. What can students compare? How could they write the ratio? Give students time to share ideas. Slide 11 shows that for every 6 balloons, there are 4 presents. The ratio is 6:4. What if students want to focus on 3 balloons? Slide 12 shows that for every 3 balloons, there are 2 presents. This can be written as 3:2. What do students notice about the 2 ratios? Slide 13 shows that if students divide the first ratio numbers by 2, they get the second ratio. 3:2 is 6:4 in simplified form, so they are equivalent ratios. *Note, students might notice that this is similar to simplifying fractions. The original ratio has been divided by the greatest common factor between 6 and 4. We are not explicitly showing the connection between ratios and fractions in this lesson. We will do this in later lessons.* If fractions come up in discussion it might be worth pausing to talk about students' observations. 4. Slides 14 to 16 repeat this process one more time for a new picture. Slide 14 is animated to show all of the possible ratios, while slide 17 models how to make the simplified ratios using division. **Activity: Look for ratios in different pictures and then create ratio drawings.** 1. Print and cut out picture prompts for all learning zones. Each zone also includes drawing prompts. These could be used after students have completed some of the picture prompts and have become more familiar with identifying ratios. These prompts could be stuck in books or put in piles for students to take and return as they complete them. Students could pick a card, identify different ratios that can be found in the pictures and then return the card to a pile. Encourage students to use words to describe the ratio and the ratio symbol. Students do not need to complete all of the prompts. **To support:** 1. Sunlight Zone picture totals go up to 15. **To challenge:** 1. Students could identify all of the ratios that can be seen in each picture. 2. Encourage students to write the ratios in their simplest form. 3. Students could complete the ratio drawing pictures. (These could be used for display purposes.)	**Classroom Ratios:** What ratios can students find in their classroom or school? **Discuss:** 1. You might discuss the ratio of boys/girls, adult/ students ratios on school trips, pets/no pets, those who play a musical instrument/those who don't, etc.

Things that might be useful for this lesson:

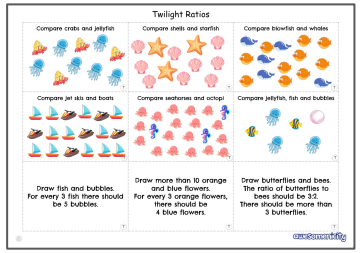
- Individual whiteboards:
  - ➔ Help students to record their thinking and share ideas with others.
- Counters:
  - ➔ For students who need support. They could use these to replicate the collection and find ratios.

Peek at the Printables:

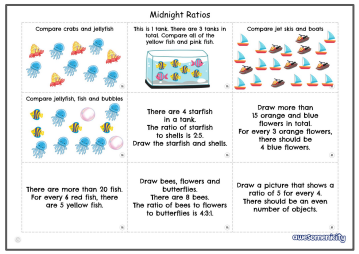
Sunlight Zone



Twilight Zone



Midnight Zone



Greener Alternatives:

➔ Rather than using the printables, you could create different stations with collections of items around the class. Students could move between the stations to find the ratios evident in each collection.
For example:

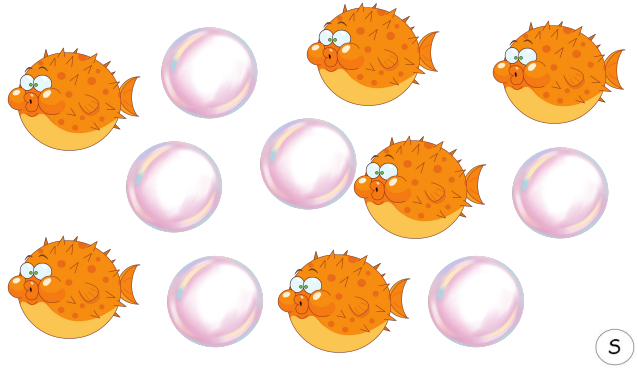
- Colour counters/blocks
- Pencils/pens
- Different shapes
- Nature items (seeds, leaves, petals, etc.)

Sunlight Ratios

Compare crabs and seahorses

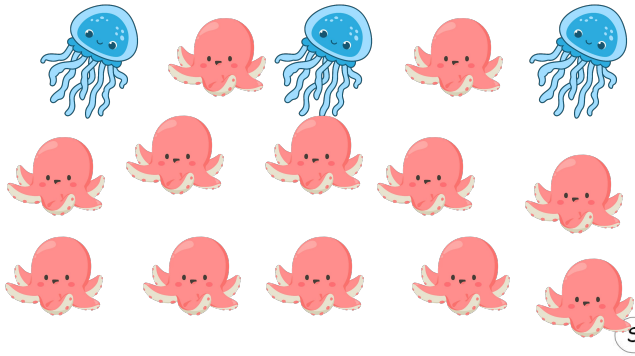
Compare shells and starfish

Compare blowfish and bubbles

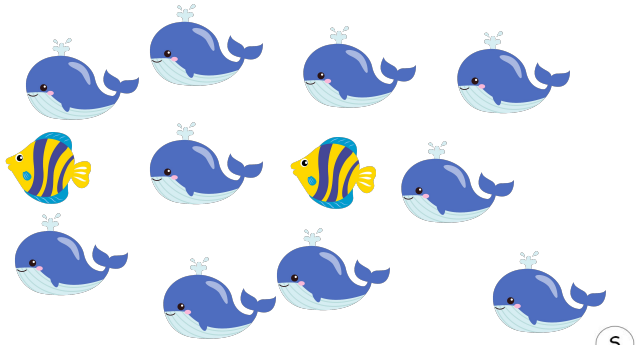


Compare jet skis and boats

Compare jellyfish and octopi



Compare whales and fish



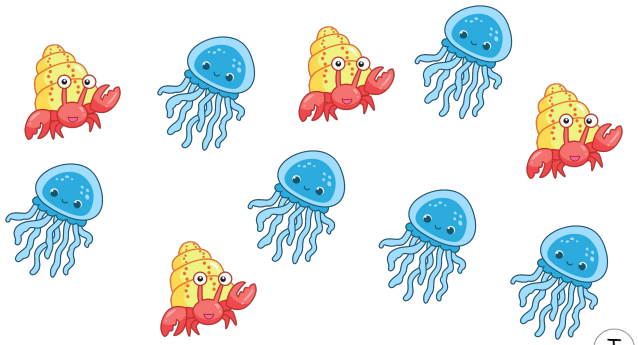
Draw fish and bubbles.
The ratio of fish to bubbles should be 2:5.

Draw orange and blue flowers.
For every 3 orange flowers, there should be 4 blue flowers.

Draw butterflies and bees.
The ratio of butterflies to bees should be 2:3.
There should be more than 2 butterflies.

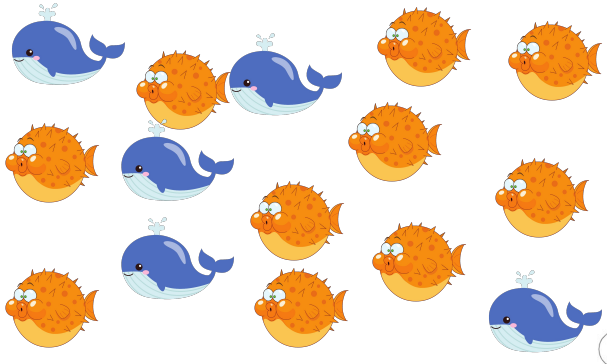
Twilight Ratios

Compare crabs and jellyfish



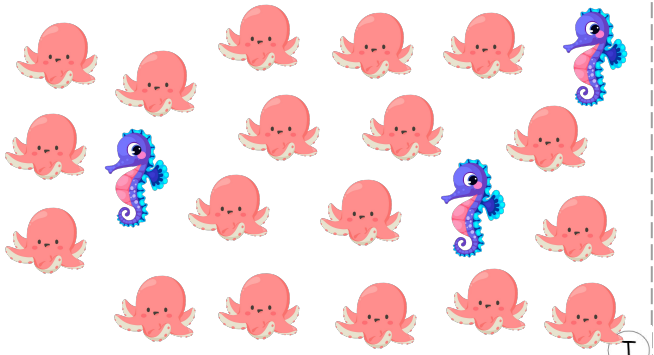
Compare shells and starfish

Compare blowfish and whales

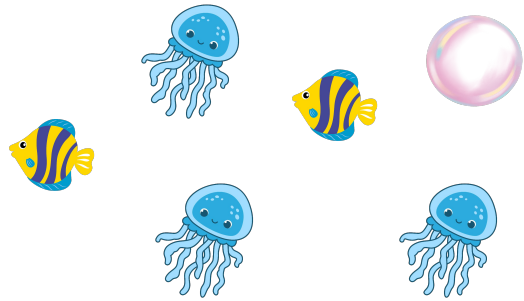


Compare jet skis and boats

Compare seahorses and octopi



Compare jellyfish, fish and bubbles



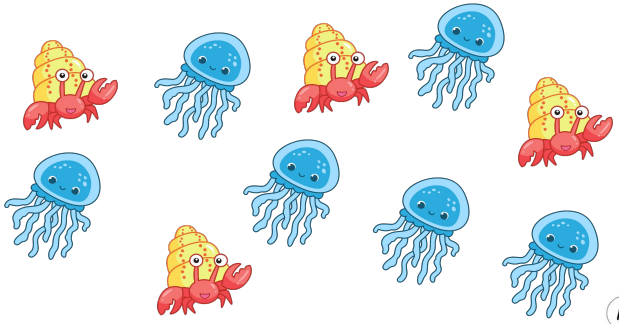
Draw fish and bubbles.
For every 3 fish there should be 5 bubbles.

Draw orange and blue flowers. There should be at least 10 flowers in total.
For every 3 orange flowers, there should be 4 blue flowers.

Draw butterflies and bees.
The ratio of butterflies to bees should be 3:2.
There are at least 6 bees.

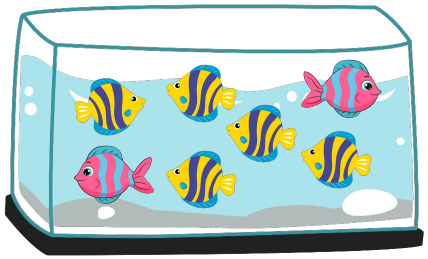
Midnight Ratios

Compare crabs and jellyfish



M

This is 1 tank. There are 3 tanks in total. Compare all of the yellow fish and pink fish.

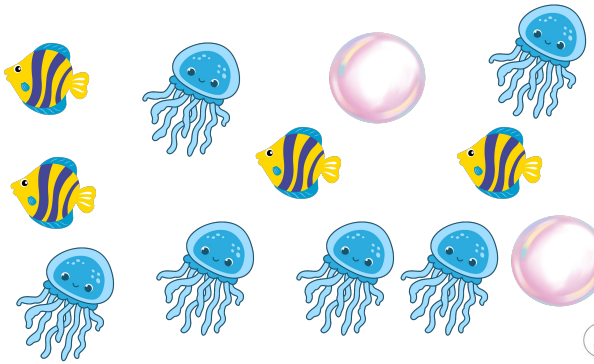


M

Compare jet skis and boats

M

Compare jellyfish, fish and bubbles



M

There are 4 starfish
in a tank.
The ratio of starfish
to shells is 2:5.
Draw the starfish and shells.

M

Draw orange and blue flowers. There should be more than 15 flowers in total. For every 3 orange flowers, there should be 4 blue flowers.

M

There are more than 25 fish.
For every 6 red fish, there
are 5 yellow fish.

M

Draw bees, flowers
and butterflies.
There are 8 bees.
The ratio of bees to flowers
to butterflies is 4:3:1.

M

Draw a picture that shows a ratio of 5 for every 4. There should be an even number of objects. There should be more than 20 objects.

M

Recording Logs

I'm comparing	For every...there are...	Ratio

I'm comparing	For every...there are...	Ratio

Sunlight Answers

Answers will vary. Below are possible answers.

Compare crabs and seahorses For every 4 crabs there are 2 seahorse. (4:2) For every 2 seahorses there are 4 crabs. (2:4) For every 2 crabs there is 1 seahorse. (2:1) For every seahorse there are 2 crabs. (1:2)	Compare shells and starfish For every 6 shells there are 2 starfish. (6:2) For every 2 starfish there are 6 shells. (2:6) For every 3 shells there is 1 starfish. (3:1) For every starfish there are 3 shells. (1:3)	Compare blowfish and bubbles For every 6 blowfish there are 6 bubbles. (6:6) For every 6 bubbles there are 6 blowfish. (6:6) For every blowfish there is a bubble. (1:1) For every bubble there is a blowfish. (1:1)
Compare jet skis and boats For every 4 jet skis there are 6 boats. (4:6) For every 6 boats there are 4 jet skis. (6:4) For every 2 jet skis there are 3 boats. (2:3) For every 3 boats there are 2 jet skis. (3:1)	Compare jellyfish and octopi For every 3 jellyfish there are 12 octopi. (3:12) For every 12 octopi there are 3 jellyfish. (12:3) For every jellyfish there are 4 octopi. (1:4) For every 4 octopi there is 1 jellyfish. (4:1)	Compare whales and fish For every 10 whales there are 2 fish. (10:2) For every 2 fish there are 10 whales. (2:10) For every 5 whales there is 1 fish (5:1) For every fish there are 5 whales. (1:5)
Draw fish and bubbles. The ratio of fish to bubbles should be 2:5. There should be 2 fish for every 5 bubbles.	Draw orange and blue flowers. For every 3 orange flowers, there should be 4 blue flowers. There should be 3 orange flowers for every 4 blue flowers.	Draw butterflies and bees. The ratio of butterflies to bees should be 2:3. There should be more than 2 butterflies. Answer will vary. There could be 4 butterflies and 6 bees.

Twilight Answers

Answers will vary. Below are possible answers.

Compare crabs and jellyfish For every 4 crabs there are 6 jellyfish. (4:6) For every 6 jellyfish there are 4 crabs. (6:4) For every 2 crabs there are 3 jellyfish. (2:3) For every 3 jellyfish there are 2 crabs. (3:2)	Compare shells and starfish For every 9 shells there are 3 starfish. (9:3) For every 3 starfish there are 9 shells. (3:9) For every 1 starfish there are 3 shells. (1:3) For every 3 shells there is 1 starfish. (3:1)	Compare blowfish and whales For every 10 blowfish there are 5 whales. (10:5) For every 5 whales there are 10 blowfish. (5:10) For every whale there are 2 blowfish (1:2) . For every 2 blowfish there is 1 whale. (2:1)
Compare jet skis and boats For every 6 jet skis there are 12 boats. (6:12) For every 12 boats there are 6 jet skis. (12:6) For every jet ski there are 2 boats. (1:2) For every 2 boats there is 1 jet ski. (2:1)	Compare seahorses and octopi For every 3 seahorses there are 18 octopi. (3:18) For every 18 octopi there are 3 seahorses. (18:3) For every seahorse there are 6 octopi. (1:6) For every 6 octopi there is 1 seahorse. (6:1)	Compare jellyfish, fish and bubbles For every 3 jellyfish there are 2 fish and 1 bubble. (3:2:1) For every 1 bubble there are 2 fish and 3 jellyfish. (1:2:3) For every 2 fish there are 3 jellyfish and 1 bubble. (2:3:1)
Draw fish and bubbles. For every 3 fish there should be 5 bubbles. Answers will vary. The ratio of fish to bubbles is 3:5	Draw orange and blue flowers. There should be at least 10 flowers in total. For every 3 orange flowers, there should be 4 blue flowers. Answers will vary. There could be 6 orange flowers and 8 blue flowers.	Draw butterflies and bees. The ratio of butterflies to bees should be 3:2. There are at least 6 bees. Answers will vary. There could be 9 butterflies and 6 bees.

Midnight Answers

Answers will vary. Below are possible answers.

Compare crabs and jellyfish For every 4 crabs there are 6 jellyfish. (4:6) For every 6 jellyfish there are 4 crabs. (6:4) For every 2 crabs there are 3 jellyfish. (2:3) For every 3 jellyfish there are 2 crabs. (3:2)	This is 1 tank. There are 3 tanks in total. Compare all of the yellow fish and pink fish. For every 15 yellow fish, there are 6 pink fish. (15:6) For every 6 pink fish, there are 15 yellow fish. (6:15) For every 5 yellow fish there are 2 pink fish. (5:2) For every 2 pink fish there are 5 yellow fish. (2:5)	Compare jet skis and boats For every 7 jet skis there are 14 boats. (7:14) For every 14 boats there are 7 jet skis. (14:7) For every jet ski there are 2 boats. (1:2) For every 2 boats there is 1 jet ski. (2:1)
Compare jellyfish, fish and bubbles For every 6 jellyfish there are 4 fish and 2 bubbles. (6:4:2) For every 1 bubble there are 2 fish and 3 jellyfish. (1:2:3) For every 2 fish there are 3 jellyfish and 1 bubble. (2:3:1)	There are 4 starfish in a tank. The ratio of starfish to shells is 2:5. Draw the starfish and shells. There should be 4 starfish and 10 shells.	Draw orange and blue flowers. There should be more than 15 flowers in total. For every 3 orange flowers, there should be 4 blue flowers. Answers will vary. There could be 9 orange flowers and 12 blue flowers.
There are more than 25 fish. For every 6 red fish, there are 5 yellow fish. Answers will vary. There could be 18 red fish and 15 yellow fish.	Draw bees, flowers and butterflies. There are 8 bees. The ratio of bees to flowers to butterflies is 4:3:1. There should be 8 bees, 6 flowers and 2 butterflies.	Draw a picture that shows a ratio of 5 for every 4. There should be an even number of objects. There should be more than 20 objects. Answers will vary. There should be an even number of objects. The total should be more than 20.