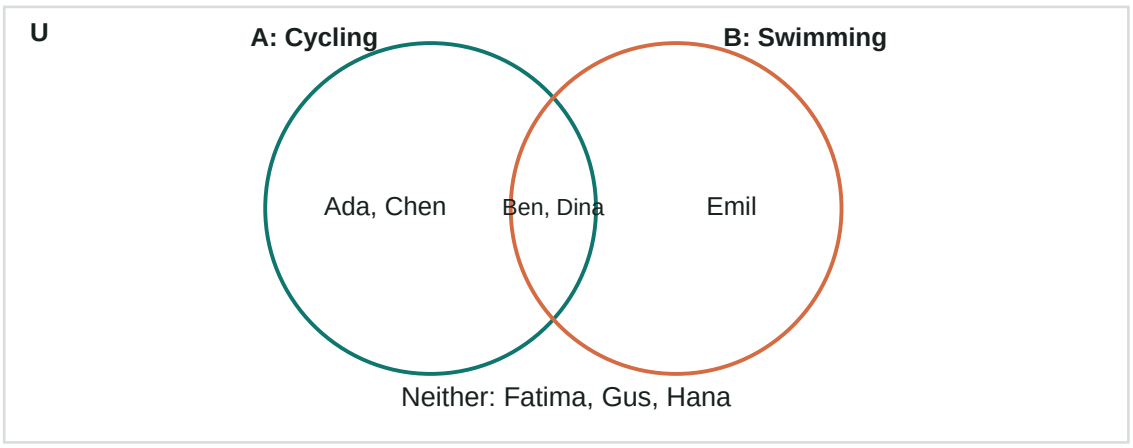
Venn diagrams: worked examples

Name: _____ Class: _____ Date: _____

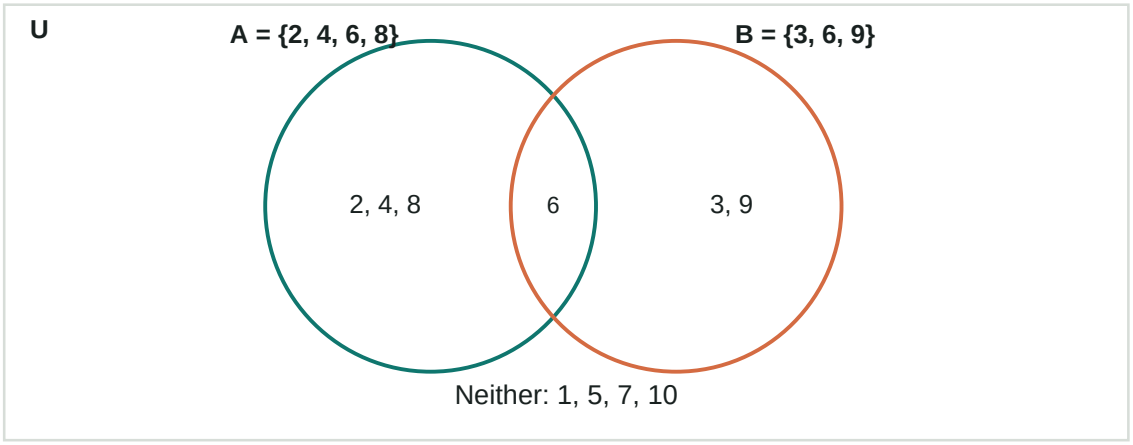
A Venn diagram shows membership of overlapping sets. The union contains items in either set or both; the intersection contains items in both. A complement contains the items outside a set but inside a specified universal set.

Find shared and unique club members



The universal set is eight fictional pupils: Ada, Ben, Chen, Dina, Emil, Fatima, Gus and Hana. Set A, cycling, contains Ada, Ben, Chen and Dina. Set B, swimming, contains Ben, Dina and Emil.

Use a numerical universal set



Let U be the whole numbers 1 through 10. Let A = {2, 4, 6, 8} and B = {3, 6, 9}. Items are set members, not repeated measurements.

Original fictional data. Full explanations and copyable datasets: chartmaker.tools/lessons/venn-diagrams-union-intersection-complements

Five practice questions

Name: _____ Class: _____

1. Which pupils are in the intersection of cycling and swimming?

2. How many pupils are in at least one of the two clubs? Show a calculation.

3. List the complement of cycling within the eight-pupil universal set.

4. For the number sets, list the union and state how many numbers are in neither set.

5. If 6 is entered twice in the numerical set A, should the union count change? Explain.

Teacher answers and working

Venn Diagrams: Union, Intersection and Complements with Worked Examples

Keep this page separate when handing out student pages 1-2.

Question 1

Ben and Dina are in both lists, so the intersection contains 2 pupils.

Question 2

4 + 3 - 2 = 5 pupils. Subtracting the overlap avoids counting Ben and Dina twice.

Question 3

Emil, Fatima, Gus and Hana. These four pupils are in U but not in cycling.

Question 4

The union is {2, 3, 4, 6, 8, 9}. It has 6 members, leaving 10 - 6 = 4 numbers in neither set.

Question 5

No. A set contains distinct members. Repeating 6 does not create an additional item or change membership of any region.

Teaching notes

Adding the two set totals without subtracting the shared members.

Confusing A only with all members of A.

Calculating a complement without defining the universal set.

All data is fictional. Accept equivalent notation and explanations. Encourage students to show calculations, units and the conventions used.