

Classifying triangles: equilateral, isosceles and scalene

CURRICULUM ALIGNMENT

SHA.SHP.3a

investigate and analyse the properties of 3-D and 2-D shapes and identify classes of shapes based on these properties.

INTERACTIVES

Drag Sort · challenge, display

WHAT THIS LESSON TEACHES

Sort a triangle by how many of its sides match. All three sides equal is equilateral; exactly two sides equal is isosceles; no two sides equal is scalene.

→ A yield road sign has all three sides the same length, so it is equilateral.

→ A set square with three different side lengths is scalene, whichever way you turn it.

MODEL THIS ON THE BOARD

NAMING A TRIANGLE BY ITS SIDES

- 1 A paper triangle has sides of **7 cm**, **7 cm** and **7 cm**.
- 2 Compare the sides: all **three** are the same length.
- 3 A triangle with all three sides equal is **equilateral**.

DISCUSSION STARTER

REFLECT

What do you check first to name a triangle — equal sides or equal angles?

LESSON ARC

Show the three triangles in the opening picture in Getting Started and pull out what's the same (three sides, three corners) versus different (side lengths). The Watch and Notice demo lays a paper strip along each side to prove the matches, ending on a tilted scalene to show turning changes nothing. Pupils take board turns in Try It Together, then draw one of each in their copy. The Class Challenge builds families from strips, including the impossible 3-3-7.

TEACHING MOVES

1. **Getting Started.** Keep all three triangles on the board at once and take two or three hands-up answers, not call-outs. Steer toward 'three sides and three corners' for the same, 'the side lengths' for the different — that contrast is what the whole lesson hangs on, so don't rush past it.
2. **Watch and Notice.** Lay a paper strip along one side and physically check it reaches along the others — all three for equilateral, two for isosceles, none for scalene. Say 'isosceles' slowly and have the class echo it once. On the tilted scalene, ask 'has anything about the sides changed just because I turned it?'
3. **Try It Together.** Before each pupil drags a triangle to its family, have the watching class predict which sides match. Use the on-screen strip check for any triangle that's hard to judge by eye. Rotate pupils briskly — this round is for talking it through, not marking.
4. **Draw One of Each in Your Copy.** Walk the room glancing for three clearly different triangles with correct labels. Watch for the equilateral drawn too lopsided and the scalene drawn with two sides that look equal — point and ask the pupil to re-check by eye.

5. **Class Challenge.** Pupils work the four strip-builds in order at their desks; name the family aloud as a class after each. For the 3-3-7 build, have pupils lay the two 3 cm strips end to end against the 7 cm strip so they see the gap, then ask 'why won't it close?' before telling them.
6. **What Did We Notice?.** Listen for a pupil spotting that an equilateral triangle also has two equal sides. Revoice it: 'so all-equal beats two-equal — we name it by the most that matches.' Head off any idea that turning a triangle moves it between families.

COMMON MISCONCEPTIONS

⚠ A pupil sorts an equilateral triangle as isosceles, reasoning 'it has two sides the same too'.

Agree it genuinely does have two equal sides — then show with the paper strip that all three match.

Name the rule out loud: we give it the strongest name, equilateral, because all three sides match, not just two.

⚠ A pupil decides a tilted or upside-down triangle has changed family just because it now points sideways.

Go back to the tilted triangle from Watch and Notice and let the pupil compare its sides with the upright one. Ask 'which sides matched before — do they still match now?' Turning moves the picture, never the side lengths.

⚠ Pupils believe any three side lengths will build a triangle and are puzzled when 3-3-7 won't close.

Lay the two 3 cm strips end to end (6 cm) flat against the 7 cm strip so the gap is visible. The two short sides can't reach across to meet — let pupils see the gap before you state that the two shorter sides must together beat the longest.

DIFFERENTIATION

EMERGING

- Stay with equilateral versus scalene only at first — the all-match / none-match contrast is the clearest; bring in isosceles once those two are secure.
- Hand these pupils the strip to physically lay along each side rather than judging matches by eye, so the check is concrete.

DEVELOPING

- After the copybook draws, ask them to mark the equal sides on each triangle with little dashes, the way side lengths are shown on the shape cards.
- Challenge them to build a fourth triangle from strips and write which family it lands in and why.

PROFICIENT

- Pose: 'A triangle has sides 4 cm, 4 cm and 8 cm — will it close? Predict before you build, then explain using the strip gap.' Have them try it as a copybook moment, then read into the Student Activity Book page.
- Ask them to explain to the class, in their own words, why we name an all-equal triangle equilateral and not isosceles.

✂ **Cross-curricular:** Tie to Geography — pupils hunt for triangle families in Irish road signs (the yield sign is equilateral) on the walk or drive to school.

ANSWER KEY

a) 5 cm, 5 cm, 5 cm: equilateral

b) 6 cm, 6 cm, 4 cm: isosceles

c) 7 cm, 5 cm, 3 cm: scalene

d) 8 cm, 8 cm, 8 cm: equilateral

e) 9 cm, 6 cm, 9 cm: isosceles

f) 10 cm, 7 cm, 4 cm: scalene

Q1: equilateral

Q2: isosceles

Q3: scalene

Q4: equilateral

Spot: Equilateral means ****all three**** sides are equal. A triangle with exactly two sides equal is ****isosceles****. So 5 cm, 5 cm, 3 cm is isosceles.

EXTENSION SHEET · STRETCH ANSWERS

S1: a regular pentagon

S2: a regular hexagon

S3: a rhombus

S4: a rhombus

S5: an isosceles trapezium