Bigger or Smaller? How to play

2–6 players
ages 7 and up · 15 minutes

What's in the deck

54 cards in three suits of 18: **Length** (how long), **Mass** (how heavy) and **Height** (how tall). Each card shows a thing, exactly what is measured, and its value, printed small and upside down at the foot so nobody reads it by accident. Turn the card round to read it.

Only compare cards of the same suit. Length meets length, never mass. Inside a suit every pair is a fair duel: the bigger one is at least 15% bigger, and for animals and other things that vary, the typical ranges never overlap.

Get ready

1. Cut out the cards (and glue or print the backs on, if you like).
2. Sort them into three suit piles, shuffle each pile and put it face down.
3. Have a pencil and paper ready to keep score.

Play

1. On your turn, pick a suit pile and turn its top two cards face up, side by side. Read out the names and what is measured.
2. Everyone counts "three, two, one" and points at the card they think is **bigger**: longer, heavier or taller.
3. Turn both cards round and read the values. Everyone who pointed at the bigger card scores a point.
4. Put the pair aside. The player on the left goes next.

The first player to 10 points wins. In a long game, play until the piles run out.

Stuck on a value? "About" means a typical figure: animals vary, and some things are measured in rounded numbers. The Mass suit runs from a table tennis ball to the Sun, so the biggest masses are written in powers of ten: 10^{24} is a 1 with 24 zeros.

Higher or lower (1 or more players)

Turn up one card. Before you turn the next card of the same pile, say "bigger" or "smaller". Keep going until you are wrong; your score is the number you got right. Beat your best.

Line them up (2–4 players or teams)

Deal five cards from one suit to each player, face up. Put them in order, smallest to biggest, without turning them round. Then check the values: one point for every card in the right place.

Classroom: stand left or stand right

Hold up two cards of one suit. Pupils go to the left or the right side of the room (or hold up one or two fingers) for the bigger one. Reveal, then ask the group what surprised them. Scan a card's QR code to show the two things drawn to the same scale on a screen.

The QR codes

Each code opens that thing's page on Size Duel, with its drawing and where the number comes from. Scanning is optional: the game works without a phone.

Free to print for personal, classroom and library use. Please don't sell or republish the cards.

Teacher notes

Bigger or Smaller?
measurement, estimation, powers of ten

What pupils practise

- **Measurement and units:** micrometres to kilometres, grams to tonnes, with imperial units in brackets.
- **Comparing and ordering** lengths, masses and heights, and saying what exactly is measured ("nose to tail", "height of the outer wall").
- **Estimation:** pupils commit to a guess before they see the number.
- **Ratios:** "how many times longer?" Divide one value by the other.
- **Powers of ten and standard form:** the Mass suit goes from a table tennis ball (2.7 g) to the Sun (1.99×10^{30} kg).

Suggested lesson (20–30 minutes)

1. Show one pair of cards and vote. Reveal and talk about why most people guessed what they did.
2. Play in groups of three to five for ten minutes.
3. Give each group one suit to line up from smallest to biggest, then check against the answer key.
4. Ask each group for the pair that surprised them most, and why.

Questions to ask

- Why can't we compare a length card with a mass card?
- Why do some values say "about"? What would make a fair comparison between two animals?
- A blue whale is about 25 m long. How many giant anteaters is that, nose to tail?
- Which is easier to picture: 828 m or 2,717 ft? Why do we use both?

Where the numbers come from

Every value is from Size Duel's size deck, checked against two independent sources (often Wikidata plus an encyclopedia, a museum, a national park service or an official rule book). Each card's QR code opens its page with the sources. Animals use typical adult values; their natural range is kept apart from every other card in the suit, so a big or small individual never changes an answer.

Printing

Print at 100% ("Actual size"), not "Fit to page". Thin card (160–200 g/m²) works best; on ordinary paper the values can show through. For backs, print the double-sided file and flip on the long edge, or print the backs page on the reverse of each card sheet. Cut along the grey lines, or use the corner marks with a ruler and craft knife.

The cards print well in black and white: every suit is named in words and has its own symbol (a ruler, a weight, an arrow up).

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Answer key

Bigger or Smaller?
every card, smallest first

Length

1. **Human red blood cell**
   about 7.5 µm
2. **1 euro coin**
   23.25 mm (0.915 in)
3. **Bee hummingbird**
   about 58 mm (2.28 in)
4. **Basketball (size 7)**
   about 24.2 cm (9.53 in)
5. **Rabbit (wild)**
   about 44 cm (1.44 ft)
6. **Giant anteater**
   about 1.1 m (3.61 ft)
7. **Komodo dragon**
   about 2.5 m (8.2 ft)
8. **Great white shark**
   about 4.75 m (15.6 ft)
9. **Humpback whale**
   about 15 m (49.2 ft)
10. **Blue whale**
    about 25 m (82 ft)
11. **Concorde**
    61.66 m (202 ft)
12. **Airbus A380**
    72.72 m (239 ft)
13. **Football pitch (international)**
    about 105 m (344 ft)
14. **RMS Titanic**
    269.1 m (883 ft)
15. **Sydney Harbour Bridge (arch)**
    503 m (1,650 ft)
16. **Øresund Bridge**
    7.845 km (25,740 ft)
17. **Marathon**
    42.195 km (26.22 mi)
18. **Suez Canal**
    193 km (120.1 mi)

Mass

1. **Table tennis ball**
   2.7 g (0.0952 oz)
2. **Tennis ball**
   about 57.6 g (2.03 oz)
3. **Baseball**
   about 145.5 g (5.13 oz)
4. **Football (size 5)**
   about 430 g (15.2 oz)
5. **Human brain**
   about 1.35 kg (2.98 lb)
6. **Bald eagle**
   about 4.3 kg (9.48 lb)
7. **Shot (men's)**
   7.26 kg (16 lb)
8. **King penguin**
   about 11.8 kg (26 lb)
9. **Cheetah**
   about 50 kg (110 lb)
10. **Lion (male)**
    about 189 kg (417 lb)
11. **Polar bear (male)**
    about 450 kg (992 lb)
12. **Hippopotamus**
    about 1.5 t (3,307 lb)
13. **James Webb Space Telescope**
    about 6.2 t (13,670 lb)
14. **International Space Station**
    420 t (925,300 lb)
15. **The Moon**
    7.35×10^{22} kg
16. **Earth**
    5.97×10^{24} kg
17. **Jupiter**
    1.9×10^{27} kg
18. **The Sun**
    1.99×10^{30} kg

Height

1. **Tennis net (centre)**
   91.4 cm (3 ft)
2. **Emperor penguin**
   about 1.12 m (3.67 ft)
3. **Gorilla (male)**
   about 1.7 m (5.58 ft)
4. **Football goal**
   2.44 m (8.01 ft)
5. **Basketball rim (NBA)**
   3.05 m (10 ft)
6. **Giraffe**
   about 5 m (16.4 ft)
7. **Upper Falls (Yellowstone)**
   about 33.2 m (109 ft)
8. **Colosseum**
   48.5 m (159 ft)
9. **Leaning Tower of Pisa**
   about 58.4 m (191 ft)
10. **Statue of Liberty**
    93 m (305 ft)
11. **Great Pyramid of Giza**
    139 m (454 ft)
12. **Washington Monument**
    169 m (555 ft)
13. **Golden Gate Bridge tower**
    227 m (745 ft)
14. **Grande Dixence Dam**
    285 m (935 ft)
15. **Eiffel Tower**
    330 m (1,083 ft)
16. **Petronas Towers**
    452 m (1,483 ft)
17. **CN Tower**
    553.3 m (1,815 ft)
18. **Burj Khalifa**
    828 m (2,717 ft)

Smallest at the top. Values are typical figures from Size Duel; each card's page (QR code) gives the range and the sources.

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