

Marking Guide and Model Answers — Balanced and Unbalanced Forces (A4-PHYS)

Teacher marking pack for the Physical sciences summative 'Balanced and Unbalanced Forces'. Contains a full model answer / exemplar response for all five situations, a comprehensive annotated marking guide for the four rubric criteria, a worked on-balance judgement, a note on the gravity misconception, and guidance for marking adjusted (ABLEWA) responses. For teacher and moderation use only.

This pack supports fair, consistent marking of the **Balanced and Unbalanced Forces** task. It contains a model exemplar for all five situations, an annotated marking guide for each rubric criterion, a worked on-balance judgement, a note on the gravity misconception, and notes for marking adjusted responses. It is for teacher and moderation use — not shown to students beforehand.

Model exemplar response (a "High" answer)

Situation 1 — book on a table. Two arrows drawn: one down (gravity) and one up (the table pushing up), roughly equal in length. "The forces are *balanced* because the book is not moving — the table pushes up just as hard as gravity pulls down."

Situation 2 — ball on grass. "The force slowing the ball is *friction*. It is a *contact* force. While the ball slows down the forces are *unbalanced*, because friction is bigger than any forward force, so the ball changes speed."

Situation 3 — two magnets. "This is *magnetism*. It is a force *at a distance* (non-contact) because the magnets pull together without touching."

Situation 4 — tug-of-war. Arrows drawn with the left arrow clearly *bigger*. "The forces are *unbalanced* because one team pulls harder. The rope and flag move towards the left team, in the direction of the bigger force."

Situation 5 — sorting (model):

Contact force	Force at a distance
friction, a push, a pull	gravity, magnetism

Comprehensive marking guide — applying the four criteria

1. REPRESENTING FORCES WITH ARROWS (30)

Band	What you should see
High (5–6)	Clear, correctly directed and labelled arrows, using arrow <i>size</i> to show the size of each force.
Sound (3–4)	Labelled arrows in the correct directions.
Limited (1–2)	Arrows with some errors in direction or labelling.

Look for: in the tug-of-war, the winning side's arrow should be visibly longer — using length to show size is the mark of High.

2. BALANCED AND UNBALANCED FORCES (30)

Band	What you should see
High (5–6)	Correctly identifies balanced vs unbalanced in every situation and justifies each <i>from the object's movement</i> .
Sound (3–4)	Correct in most situations with some justification.
Limited (1–2)	Correct in a simple case with little justification.

Look for: the reasoning link "it's not moving, so balanced" / "it's speeding up or slowing, so unbalanced" — justification from motion is what lifts a response to High.

3. CONTACT AND NON-CONTACT FORCES (25)

Band	What you should see
High (5–6)	Correctly classifies all forces as contact or at-a-distance and names the forces (friction, gravity, magnetism).
Sound (3–4)	Classifies and names most correctly.
Limited (1–2)	Some classification or naming errors.

4. COMMUNICATION AND SCIENTIFIC VOCABULARY (15)

Band	What you should see
High (3)	Clear ideas using correct terms (force, balanced, unbalanced, contact, at a distance, friction, gravity, magnetism) throughout.
Sound (2)	Clear with some scientific vocabulary.
Limited (1)	Unclear or little scientific vocabulary.

Note on the gravity misconception

Many students write that gravity "pulls things down". Scientifically, gravity pulls objects with mass *together*; things fall towards Earth because Earth is so massive. In Situation 1, **credit a correct downward arrow** (down is correct for a book on Earth) but look in the explanations for the chance to note this idea. Do not over-penalise "down" language at Year 4 — but a student who articulates "pulled towards the Earth" shows deeper understanding worth crediting under Communication.

Worked on-balance judgement

A student draws all arrows correctly and makes the tug-of-war arrow longer (Representing 6/6), correctly calls all five balanced/unbalanced but justifies only some from motion (Balanced/unbalanced 5/6), classifies and names every force correctly (Contact/non-contact 6/6), and writes clearly with good vocabulary (Communication 3/3). Total $\approx 20/21 \rightarrow$ **High**. Even with one or two thin justifications, the accuracy across arrows, classification and vocabulary is clearly High.

Marking adjusted (ABLEWA) responses

Where a student used the additional-support approach (placing pre-printed long/short arrows, two-choice "moves/stays still" and "touching/not touching" cards, pointing/AAC, scribed answers), mark the science evidence. Placing a longer arrow for the bigger force is valid for Representing forces; choosing "moves" for the tug-of-war is valid for Balanced/unbalanced; sorting a force as "no touching" is valid for Contact/non-contact. Record adjustments beside the result; see the lesson's additional-support approach for Stage A–D descriptors.

Co-mark 3–4 scripts across the range first and agree annotations, so the bands mean the same for everyone.