

Earth and the planets

Autumn 1 · Week 6 · Lesson A · 40 minutes

Learning objective

Describe Earth and the other planets orbiting the Sun: order eight planets, group rocky/giant planets, and explain the Sun's inward gravitational pull.

Source lesson timing

Elapsed minutes	Source stage	Minutes
0–1	Title	1
1–5	Arrival Task	4
5–7	Today at a Glance	2
7–16	I Do 1	9
16–26	We Do 1	10
26–30	I Do 2	4
30–40	We Do 2	10

Split slide times are added within their original source stages. Printed tasks and adaptations replace activity within these timings; they do not add extra lesson time.

Equipment and preparation

- Eight planet-name cards or the supplied word bank
- Sun and Earth paper labels; two counters; two paper arrows
- Pencils, paper and supplied approximate orbital-period table

TEACHING SEQUENCE

Guide the lesson

Use the source stage times; choose prompts appropriate to the pupil.

Title · 1 minute

Current W6 objective. Success: order eight planets; describe near-circular orbits; explain the Sun's inward gravitational pull. Assess these through pupil responses, not completion of slide viewing. This deck is Monday's 40-minute lesson.

Arrival Task · 4 minutes

Offer four name cards to supported pupils, including an accessible pointing/directing route. Standard answer Mercury, Venus, Earth, Mars. Stretch continues Jupiter, Saturn, Uranus, Neptune. Keep initial answer for later correction; do not treat this as a timed memory competition.

Today at a Glance · 2 minutes

Use current source sequence. An orbit is a curved path around another object. A year here means one planet's time for an orbit of the Sun; it is not the same number of days for every planet.

I Do 1 · 9 minutes

Read from the Sun outwards. Sun is a star, not one of the eight planets. Source terms: Solar System means Sun and everything orbiting it; gravity attracts objects; orbit is path; year is orbit time. Rocky planets are the inner four, while outer group contains two gas and two ice giants.

Explain the existing two-arrow model. Amber is the direction of the planet's velocity, not a force; teal is gravitational force towards the Sun. Their directions are approximately perpendicular for a near-circular orbit. Gravity changes motion continuously. Do not describe equal opposing forces or an outward gravitational push. The schematic circle represents a near-circular orbit; sizes and distances are not to scale.

Use desk counters rather than require public walking. Gravity arrow points Sunward; motion arrow is tangent to the path at that point. Without gravity, the straight-on tangent is the idealised prediction, not a line directly away from the Sun. Counters are moved by hand; this demonstrates an explanation, not gravity in action. Do not swing objects on strings.

We Do 1 · 10 minutes

Use spoken answers or two paper headings. Ask pupils to choose before revealing. Mercury and Mars rocky; Jupiter gas giant; Neptune ice giant. For the year comparison supply Earth 365 and Mars 687 Earth days. Mars takes longer because 687 is greater than 365.

Correct one card and explain the group. Difference $687 - 365 = 322$ days is optional arithmetic; required science is Mars takes longer for one orbit. Further-out Solar System planets have longer orbital periods. Do not infer the diagram gives accurate distances or speed. Repeat the inner-planet order; remaining source cards optional within stage.

I Do 2 · 4 minutes

Source answer shape and evidence loop. Look for order, rocky/giant classification and gravity's role. An adult may keep pupil work or write an observation with independence level; photographs are optional and not assumed. Use pupil's own explanation, with pointing to arrows equivalent to writing.

We Do 2 · 10 minutes

Pupils choose TRUE/FALSE for each and prepare one reason. Expected T,F,T,F,T for the simplified Solar System context. If a pupil raises motion around the Solar System's shared centre of mass, acknowledge extension but keep required heliocentric model clear. Avoid pretending 'Sun never moves' is necessary.

Check the five original statements in order T,F,T,F,T. Repair false claims: Earth orbits Sun; gravity acts in space and curves planetary paths. Do not add a false claim that Sun never moves. Correct one explanation after pupils have attempted the sort.

Source WAGOLL. Neptune's approximately 60,190 Earth days $\div$ 365 is about 165. Its longer period reflects both a larger orbital path and lower orbital speed; do not imply equal speed. Comparing numbers suffices at supported level. No additional numerical assessment beyond source intent.

Stop Monday here as current source directs. Do not add Tuesday 32-minute workshop or exit now. Pupil may save a dictated or adult-scribed response. Next session checks model limitations, two year comparisons at standard level, and the same source success criteria.

TEACHER ANSWERS

Worked answers and expected evidence

Use after an attempt. Accept equivalent correct explanations; record support given.

1. Arrival: order from the Sun

Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune.

2. Watch and explain the orbit model

Gravity points towards the Sun; direction of motion is tangent at that position. Repeat at a second position. The arrows are not equal opposing forces.

3. Rocky or giant?

Mercury rocky; Mars rocky; Jupiter gas giant; Neptune ice giant.

4. Compare one year

Mars has the longer year: 687 Earth days exceeds 365 Earth days. Optional difference 322 days.

5. Sort and repair

Original statements T,F,T,F,T. Earth orbits the Sun; gravity acts in space. No claim that the Sun never moves is required.

6. Build the explanation

The Sun's gravity pulls Earth inward/towards the Sun and continually bends/curves Earth's moving path. Check the selected explanation, not handwriting volume.

Misconceptions and corrections

- The Sun is a star, not the ninth planet in this list.
- Most planetary orbits are close to circular; schematic circles and arrows are not size/distance/speed scales.
- The gravity arrow is a force; the tangent motion arrow is direction of motion, not a second opposing force.
- Without gravity in the idealised model, the planet follows the straight-on tangent, not a line straight out from the Sun.
- A year means one orbit, so another planet's year need not be 365 Earth days.
- Hand-moving a counter illustrates an explanation; it does not experimentally demonstrate gravity.

Teach safely; keep the evidence

The source record identifies this conversion; it is not a claim of publication.

Safety

- Use counters or a drawing on a desk; public walking is optional.
- Do not swing objects on strings.
- No viewing the Sun, lasers, electrical kit or physical force experiment is required.

Access and offline alternatives

- Pointing, signing, speech, drawing or an adult-scribed response can show the same science.
- Provide named arrows as well as colour; supported pupils can direct the adult-held model.
- All activity data and instructions are supplied offline; no NASA page or video is needed.
- No photograph, public performance or sharing is assumed; record actual independence.

Close and continue

Stop after We Do 2 at 40 minutes. Keep the planet order and explanation for W6B's 32-minute workshop. This is the current weekly W6 lesson, not a newly invented assessment or replacement for any private pack.

Source and revision

Repository: [MattRoper1977/Lessons](#)

Source path: [Science_Teesside/Grow/SCI_G_W6_Earth_And_Planets.html](#)

Source file Git blob: [4a5f555bb496b2ba8f691b4811ca23a0a0c2b1e3](#)

Current source link (mutable): https://github.com/MattRoper1977/Lessons/blob/main/Science_Teesside/Grow/SCI_G_W6_Earth_And_Planets.html

Document revision: 2026-09-06

Recorded conversion changes

- Current weekly source split at Monday's We Do 2 stop; Tuesday workshop remains separate.
- Paper cards and editable native orbit diagram replace HTML interactions.
- No publisher images, video or worksheet pages redistributed.
- Orbit represented by a schematic circle, with unscaled sizes and distances. Real planetary orbits are ellipses, most close to circular.
- Original logo not substituted; source pack and private OneDrive assets untouched.