

Refraction & Lenses

Refraction Lagoon with Glowling

Learning target

Explain a familiar refraction example.



Before you begin

Use the reference page and discussion prompts on their own, or open the optional browser adventure. No earlier lesson or physical kit is required.

For online play: use an internet-connected current browser with local storage enabled. Read the three-part Gemling briefing, answer the quick check, and apply the evidence at three checkpoints. Retry feedback supports review; results are not a secure test or gradebook.

Use for teacher-led review, science centers or partner practice. Independent readers may need support with the vocabulary below. The design target is grades 3-5; choose support based on the learner.

Vocabulary and concepts to discuss

Light changing direction between materials; water; lenses; model limits

Open Refraction Lagoon - direct lesson link

Scan the QR code or use the clickable link. This guide is usable offline; the adventure runs on an external educational website.



Refraction & Lenses - key ideas

1. The first clues

Refraction is a change in light's direction as it passes between materials under appropriate conditions. It differs from reflection at a surface.

2. How the clues connect

A lens uses refracting surfaces to redirect light. A straight object partly in water can appear bent because the light path changes.

3. Our evidence record

Our record shows a straight straw looking offset at the water surface. The refraction model explains the view without claiming the straw physically broke.

Keep the science accurate

No wavelength calculations, Snell's law or looking at the Sun/lasers. Refraction and dispersion remain clear qualitative extensions.

Apply the evidence

Use a specific observation from this lesson to explain one choice. Point to a clue, then connect that clue to a scientific idea.

Curriculum reference:

<https://www.nextgenscience.org/dci-arrangement/4-ps4-waves-and-their-applications-technologies-information-transfer>

Talk through the evidence

1. What explains the straw's apparent bend?

Expected answer: Refraction

Reasoning: Our record shows a straight straw looking offset at the water surface. The refraction model explains the view without claiming the straw physically broke.

2. What can a lens do?

Expected answer: Redirect light through refraction

Reasoning: A lens uses refracting surfaces to redirect light. A straight object partly in water can appear bent because the light path changes.

3. How does reflection differ?

Expected answer: It redirects light at a surface rather than by passing into another material

Reasoning: Refraction is a change in light's direction as it passes between materials under appropriate conditions. It differs from reflection at a surface.

4. Is the observed straw necessarily physically bent?

Expected answer: No

Reasoning: Our record shows a straight straw looking offset at the water surface. The refraction model explains the view without claiming the straw physically broke.

Guide the discussion

Ask learners to name the evidence that supports their answer. If an answer differs, revisit the matching key idea on page 2 and invite a revised explanation.

Online rewards: this lesson grants one fixed digital Expedition Discovery. Five saved digital Gemling friends become available only after all six distinct subject lessons are complete, in any order. Digital rewards do not establish physical ownership.