Teacher Notes

Unit 7 · Life Beyond Earth · Ages 9–14. Each page works on its own. Mix levels freely: ★ Explorer (ages 9–10), ★★ Navigator (11–12), ★★★ Commander (13–14). Figures are rounded; gravity is shown relative to Earth.

Page	Activity	Level	Time	Materials / notes
2	Mission Briefing	★	15 min	Read aloud.
3	Goldilocks Zone	★/★★	30 min	Calculator.
4	Extremophile Cards	★	25 min + play	Scissors, colored pencils.
5	Create & Compare	★★	30 min	Pencil.
6	Transit Method	★★★	35 min	Pencil, calculator.
7	Color by Code	★/★★	30 min	Colored pencils.
8	Mission Planner	★★/★★★	25 min	The solution is unique.
9	Alive or Not?	★	25 min	Scissors, glue.
10	Salt Lab	★★	4 hours (check hourly)	3 cups, salt, freezer. Adult help with the freezer.
11	How Many Worlds?	★★/★★★	30 min	Calculator.
12	Crossword	★★	20 min	No accents.
13	Golden Record	★/★★	30 min	Discussion welcome.
14	Unit Review	★–★★★	25 min	Quiz out of 20 points.
15	Mission Log	★	10 min	Self-assessment.

No life has been found beyond Earth yet. The numbers on page 11 are guesses.

Pages 2–8

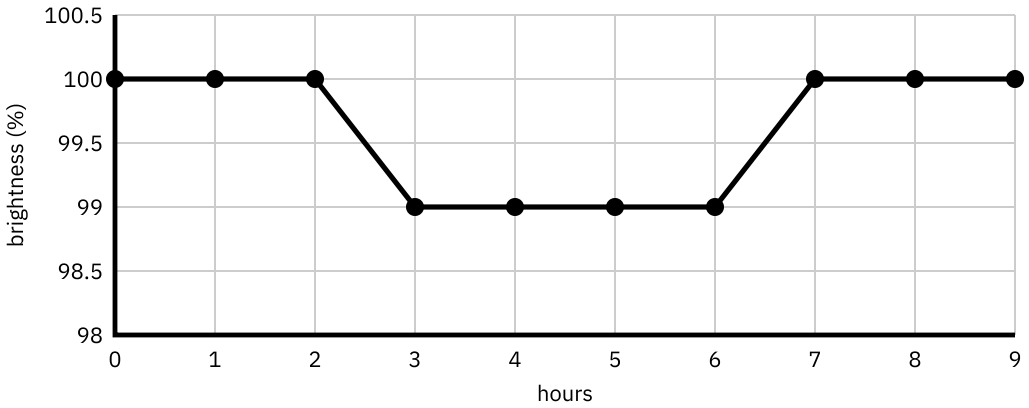
Page 3

2) **Earth and Mars (Mars at the cool edge)**. 3) 1.52 × 93,000,000 = **141,360,000** mi. 4) 0.05 × 93,000,000 = **4,650,000** mi; **Yes (0.05 < 0.39)**. 5) **Heat from tides (flexing) and geysers/hot cores keep water liquid**.

Page 5

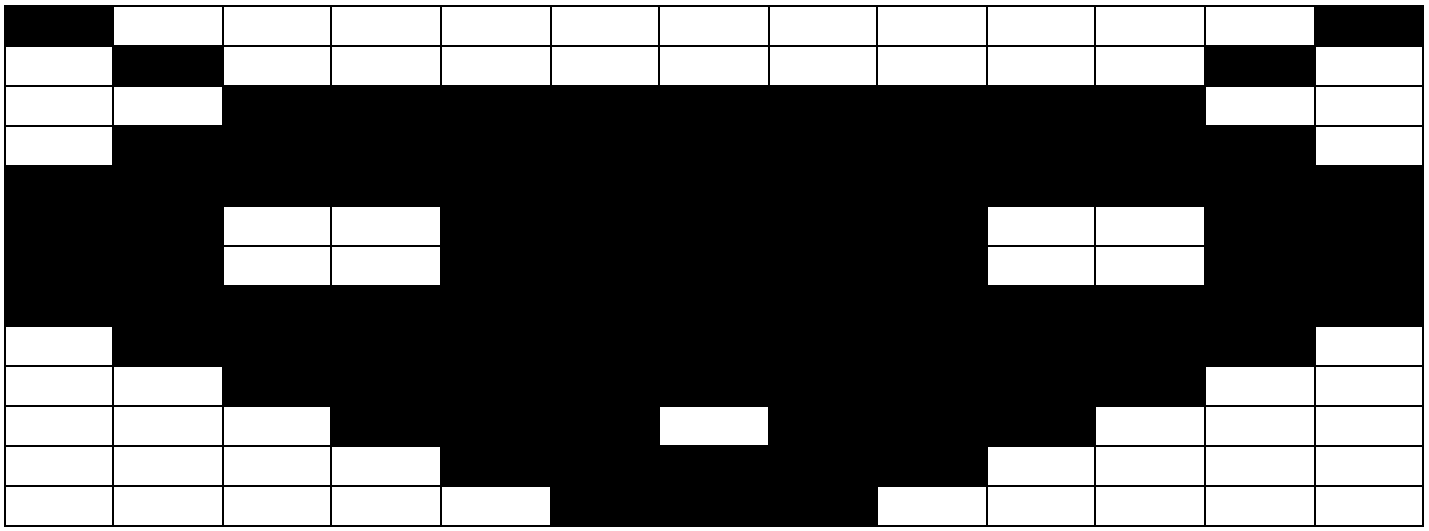
1) **Tardigrade (–458 °F to 300 °F)**. 3) 160 – 32 = **128**; × 5 ÷ 9 = **71** °C; 212 – 160 = **52** °F.

Page 6 · Transit



1) **4** hours (hour 3 to 7). 2) **1** %. 3) √0.01 = **0.1**; 0.1 × 432,000 = **43,200** mi. 4) **Jupiter**. 5) **10**.

Page 7 · Alien



1) **An alien face**. 2) **13**; **102**. 3) **25,000**.

Page 8 · Planner

Monday: **Mars** · Tuesday: **Europa** · Wednesday: **Enceladus** · Thursday: **Titan**. 1) **Enceladus**.

Pages 9–14

Page 9

Alive: **Dog, Mushroom, Seed, Bacteria, Oak tree** · Not alive: **Robot, Fire, Crystal, Mars rover, Cloud, Car** · Tricky: **Virus**. 1) **It has no cells and cannot reproduce on its own**.

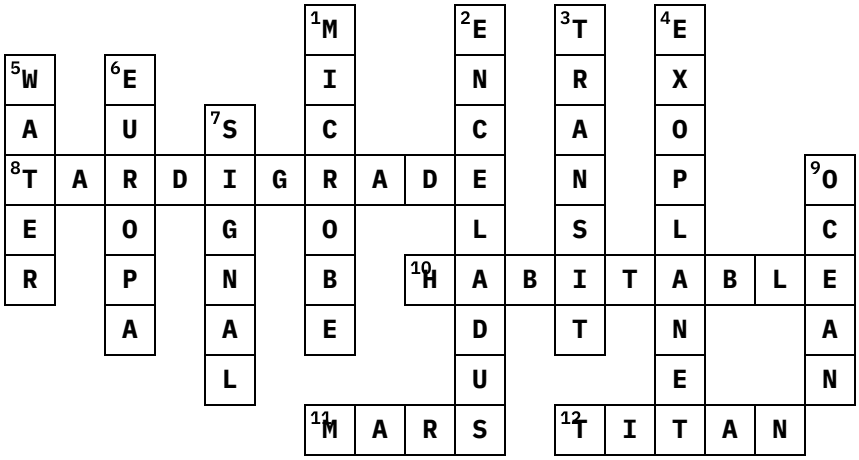
Page 10

Expected: A freezes first; C stays liquid longest (salt lowers the freezing point).

Page 11

50,000,000,000 → **10,000,000,000** → **10,000,000** → **10,000**. 1) **10,000,000**. 2) **10,000**. 4) 4.24 × 2 = **8.48**. 5) **100**.

Page 12 · Crossword



Page 14 · Review

1. habitable zone C, extremophile B, exoplanet A, transit D (4). 2. **Water, energy, building blocks, time (any three)** (2). 3. **F**, **T**, **F** (3). 4. **96** % (2). 5. **They survive extreme conditions, including space** (2). 6. **Earth, Mars, Europa, Enceladus** (3). 7–8. Open answers (2 points each).