Part A: Habitat 'To let'

Three habitats are described in the 'To let' advertisements below. For each one, describe where you might find such a habitat on Earth. What type of extremophile would be most suited to each habitat?

Stunning outlook!

Body of super-heated water available, featuring astonishing temperatures of 70–113 °C, mildly alkaline conditions included. Enjoy colourful scenery, courtesy of the neighbours, and the excitement of nearby volcanic activity. Hurry, won't last long!

1. .....

.....

.....

.....

.....

.....

.....

Icy retreat!

Want to get away from it all? Habitat available for lease in permafrost location, extremely low temperatures (-10 to -12 °C). Experience a genuine iced-in period of dormancy. Enjoy being nutrient-poor and completely inactive for thousands of years. Limited spaces, an opportunity not to be missed!

2. .....

.....

.....

.....

.....

.....

.....

Shared accommodation

Heat-loving extremophile seeks hydrothermal vent accommodation, willing to share with like-minded organisms. Prefer temperature range of 80–120 °C and an abundance of sulphur. No sunlight, must tolerate total darkness.

3. .....

.....

.....

.....

.....

.....

.....

Part B: Holiday destinations

Describe characteristics an Earth-based extremophile would need to survive a holiday in the following Solar System destinations. Do similar destinations to these exist anywhere on Earth?

Mars escape holiday

Spend twelve unforgettable days in the northern arctic of Mars. Be enchanted by the iron-rich landscape and relax in an average temperature of -60 °C. Enjoy an atmosphere loaded with carbon dioxide and experience the thrill of digging for your own water, frozen of course. Proximity to Earth will suit the budget-minded extremophile.

4. .....
.....
.....
.....
.....
.....
.....

Soak up the sulphur

Looking for adventure? Visit the magnificent sulphur-choked plains of Io's popular equatorial region. Take in the constantly changing landscape of the most volcanically active location in the Solar System. Enjoy spectacular mountain views, an atmosphere saturated with sulphur dioxide and the complete absence of water.

5. .....
.....
.....
.....
.....
.....
.....

Re-invigorate on an organic get-away

Encounter the wonders of Titan on an unforgettable methane lake escape. Encounter the restorative wonders of an environment rich in organic molecules yet poor in sunlight. Relax in the cool temperatures provided by underground volcanic out-gassing and soak up the abundant hydrocarbons. Occasional breaks in the nitrogen-soaked clouds allow the discerning traveller breathtaking views of Saturn and its rings.

6. .....
.....
.....
.....
.....
.....
.....

Part C: The search for life on Mars

- Read the fact sheet *The search for life*, then research humankind's search for life in the Solar System to answer the questions. The following websites may be useful:

NASA	http://www.nasa.gov
European Space Agency	http://www.esa.int

1. What sort of technology is used to search for life on planets, other than Earth, in the Solar System?

---

2. How did the Phoenix Mars mission differ from previous missions to Mars?

---

3. What successes and failures have humans encountered in searching for life on other planets?

---

4. Describe three missions to other worlds, highlighting similaries and differences in mission objectives and technologies used.