Name:

Mission Planner: Finding Earth's Twin

You and your group members are a team of scientists working at NASA on a project to find "Earth's twin" outside the solar system. Your team has just discovered two Earth-like exoplanets in the habitable zones of their host stars. However, you only have the resources to send a probe to one of these planets. Here is the information you know about each planet:

Planet A: this is a planet that is 1.1x the radius of Earth, and orbits its star (a G type star like our sun) within the habitable zone. It receives about the same amount of starlight as the Earth receives from the Sun.

Planet B: this is a planet that is 1.3x the radius of Earth, and orbits its star (a G type star like our sun) within the habitable zone. It receives about the same amount of starlight as the Earth receives from the Sun.

You and your team must now decide what additional measurements of the properties of these planets you need to make to determine which planet is more likely to be an "Earth twin."

1) Assuming you have unlimited resources to make these additional measurements, which properties of the planet do you choose to measure? List at least 5 measurements you would make in order of most important to least important.

a)

b)

c)

d)

e)

2) For the measurements above explain why you would make this measurement, i.e. how the measurement relates to habitability).

a)

b)

c)

d)

e)

3) For the measurements above describe your ideal result, i.e. the outcome of the measurement that would make the planet an "Earth-twin."

a)

b)

c)

d)

e)

4) Assume that one of these planets is truly an "Earth-twin." What kind of probe would you design to send to this planet? What kind of environment would you equip the probe to handle? What kind of additional measurements would it make on the surface of the planet?