**Student Worksheet: *Dune-*inspired spacesuit**

**Directions**: Answer the first set of questions as instructed by your teacher before reading the article. Then, read the online *Science News* article “A *Dune*-inspired spacesuit turns astronaut pee into drinking water” and answer the remaining questions as directed by your teacher.

**Before Reading**1. What are some shows, movies or books (besides *Dune*) that feature astronauts? List at least two. Use one of these to describe how the environment of space is different from being on Earth.

2. What functions must an astronaut’s spacesuit provide? Come up with three specific jobs that you think an astronaut’s spacesuit must do to allow an astronaut to carry out a spacewalk.

**During Reading**

1. In the *Dune* series, what function does the stillsuit provide?

2. One definition for "still" is a piece of equipment that purifies alcohol from a fermented mixture, resulting in a more concentrated alcohol product. Based on this, explain how "stillsuit" describes an aspect of the suit's function.

3. What does IDB stand for?

4. Approximately how much drinkable water do current spacesuits carry for astronauts? Explain why this is considered a limitation for astronauts.

5. In the new design, urine is routed to a filtration system. Summarize the three main steps of filtration before the drinkable water is sent to the IDB.

6. Does this proposed stillsuit require energy? Explain.

7. The technology described in this story comes with clear benefits for the astronauts, yet the technology for purifying dirty water has existed for a long time. Come up with a possible reason that spacesuits do not already come equipped with technology for filtering these waste products.

8. What is one way that Julio Rezende imagines this new spacesuit might also lead to terrestrial-based technology?

**After Reading**1. Sofia Etlin mentions that sweat would be easier to purify than urine. However, the team has chosen to focus on a single waste product — urine— for their prototype. Why do you think the team decided to purify urine if sweat would chemically be easier to filter? What extra challenges might the team face if they were to develop a new suit that processed both sweat and urine?

2. Contrast the fictional stillsuit with the new prototype regarding how the equipment is powered. Then, consider the phenomenon of piezoelectricity, which describes an ability by which certain materials, when layered properly, will generate electrical current when pressure is applied. (One example is shoes that light up with each step.) If you were a science fiction writer, how might you use the concept of piezoelectricity to make the newly designed spacesuit prototypes more like the fictional stillsuits regarding electrical power?