

Dancing Dinos™

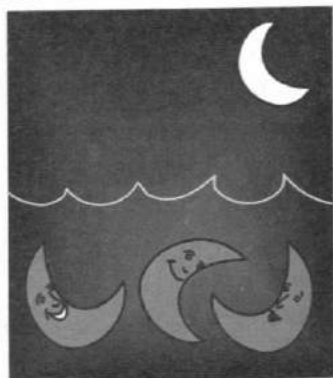
SHAKE IT IN THE DARK!

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CONTAINS LIVING ORGANISMS

which require light.

- Expose to normal room light
- Keep below 75°F
- Do not cover
- Do not cut, puncture or ingest



Dancing Dinos™ are living organisms in a miniature ocean. Lightly shake the bag at night **in the dark** to see flashes of beautiful blue light!

1. WHAT ARE THEY?

The liquid in the bag contains bioluminescent (live, light emitting) creatures called "Dinoflagellates" (Dinos). When you tap or shake them, they give off flashes of brilliant blue light.



The Dancing Dinos™ are photosynthetic -- they live off light from the sun. They are single-celled algae, and live for 3 to 4 months. Take care of them and they will multiply and turn brownish orange. Under a microscope they're moon-shaped.

2. MORE ABOUT IT...

These algae know the difference between night and day. They are bioluminescent, which means they can glow at night.



If you were to compare the ocean to land, algae would be like grass. Grass takes energy from the sun to grow, just as the Dinos do. And just as animals eat grass, many animals in the ocean eat Dinos.



3. CAUTION...

• Adult guidance is recommended for younger children.

• Dancing Dinos™ contains living organisms. Do not put liquid in mouth or eyes or on skin. If contact occurs, wash hands thoroughly. If ingestion should accidentally occur, call a physician.



4. MORE INFO?

Science Kits and other information are available from Professor Joe or his assistants at (801) 596-2675, or write to:



PROTEIN SOLUTIONS, INC.
350 West 800 North, Suite 218
Salt Lake City, Utah 84103-1441
phone/FAX: (801) 596-2675

More Information on...
Dancing Dinos™

- **How much light do they really need?** Your dinos are plants and therefore require light for energy. They should have at least 6 hours of light a day in a very bright, well-lit room. Remember that what they need are *light* photons and not heat photons, so be sure that you don't put them in direct sunlight or near a heat source. A cool fluorescent light is ideal, and they should be placed several feet away.
- **What sort of food do they need?** Because they are photosynthetic, they don't need any extra food and they will exist in their bag for months if it is completely sealed. We've had them alive in the bags for over 2 years, although the normal lifetime in the bags is 3 to 6 months.
- **Temperature?** Here they are very fussy. They don't like hot temperatures. It is best to keep them at temperatures from about 55°-75°F where they are happiest and will perform their bioluminescence.
- **Are there other kinds of these organisms?** There are over 2,000 species of dinoflagellates and most of them have never been studied by biologists or scientists. Some of them secrete toxins, but not your dinos. Most of them are not bioluminescent. We've picked *Pyrocystis lunula* because it's tough, non-toxic, and brightly bioluminescent. Your culture may contain other organisms in low concentrations. Certain other algae and marine bacteria may be present. Some of these may be dangerous in high concentrations; that is why we tell you not to puncture the bag or touch the culture. Use only under adult supervision.
- **Why is the Light Blue?** Good question! Not all bioluminescence is blue. Some fireflies and worms produce a green/yellow light, but almost all bioluminescence from ocean life is blue. Scientists think this is because blue light travels further in water than other colors.
- **Why do they light up only at night?** Many bioluminescent organisms, including the dinoflagellates in Dancing Dinos™ have circadian rhythms. They have their own built in "clock" and they know when it is supposed to be night and day. These organisms are used by biologists to study circadian rhythms. The real reason they only produce light at night isn't known; it is believed to be related to predator aversion. When a fish swims up to eat some of the bioluminescent dinoflagellates, it produces disturbances in the water; the agitation produced by the waves trigger the bioluminescence which some scientists feel then scares the fish away.
- **Can I change their night and day?** Yes. Although they have a built in biological clock, *Pyrocystis lunula* can be induced to change its night and day cycle very easily. All you have to do is decide when you want them to bioluminesce and adjust their cycle accordingly.
- **Where do they live in nature?** Some live in fresh water, but most live in salt water. Bioluminescent dinos are only found in salt water. They generally live near the surface of the ocean, within the top 100 feet or so. They are found in all the oceans of the world, although certain species prefer specific regions. In some areas at particular times of the year conditions are just right for very efficient growth and multiplication of the dinoflagellates. Under these conditions, they are said to "bloom," resulting in concentrated populations over a large area, forming "red tides."
- **What Else?** Dinoflagellates, and their cousins the diatoms, which are not bioluminescent, play a major role in the gas balance of the planet. By consuming carbon dioxide and producing oxygen, they help regulate our planet's atmosphere. Scientists are now studying them to learn of their role in minimizing the greenhouse effect. Dinoflagellates are also studied to learn about circadian cycles.
- **Want to Learn (and Do!) More?** Contact PSI for a catalog of fascinating science project kits or call the Dancing Dinos™ hotline: (801) 596-2675 or J. Andrade at (801) 581-4379.