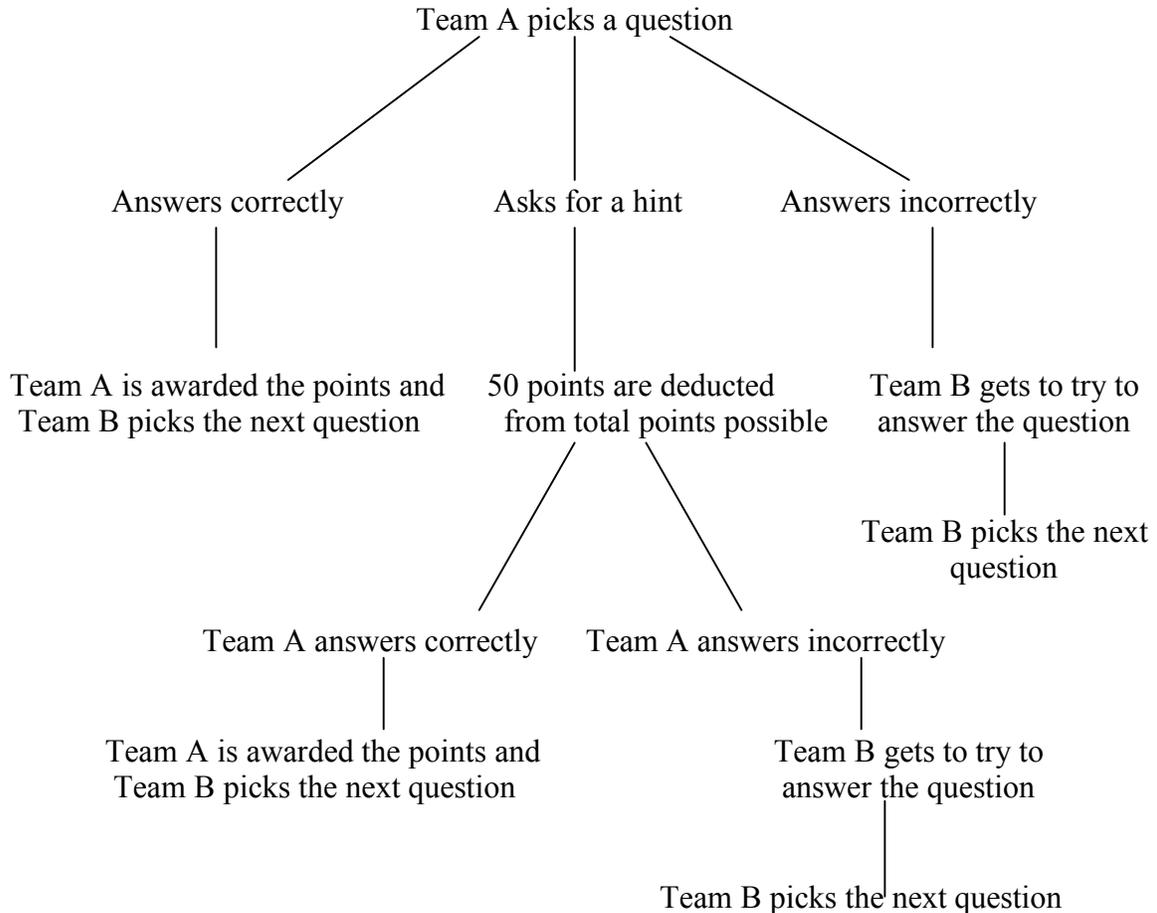


Oceanography Jeopardy!

1. Write the following categories on your chalkboard:

<u>Light/Nutrients</u>	<u>Plankton</u>	<u>Circulation</u>	<u>Phycology</u>	<u>Climate</u>
100	100	200	100	100
300	100	200	200	200
300	300	200	300	500
400	400	300	300	700
400	400	300	400	
500	500	400		

2. Have each team pick a team name and read the following instructions.
 - Team A will pick a question. It does not have to be in any order. Ex. “Plankton for 300.”
 - After the question is read, the team has one minute to consult with each other on the answer.
 - One person from the team will raise their hand and wait to be acknowledged before answering the question. No shout-outs will be acknowledged.
 - If the team does not know the answer, they can be supplied with a hint for a 50-point reduction (i.e. if the question is worth 200 points, it will only be worth 150 if a hint is provided).
 - If Team A answers the question incorrectly, it then goes to Team B to be answered.
 - Whether or not Team B answers that question correctly, they then get to pick another question.
 - If Team A answers the question correctly, they will be awarded the points and then Team B gets to pick a question.
3. Record points earned by each team on the chalk board.
4. See the following flow chart.



LET'S BEGIN!

Light/Nutrients

1. 100 – Which color has the most energy? (hint: what color is absorbed the last in the ocean?) (blue)
2. 300 – What is a limiting nutrient? (a nutrient that is necessary for growth but in limited supply...controls the amount of growth or reproduction of an organism)
3. 300 – DAILY DOUBLE!! What are two nutrients necessary for growth? (nitrate, phosphate, iron)
 - a. For 300 bonus points, identify what these nutrients are used for – name one thing for each nutrient. (NO_3 is used in DNA, amino acids, proteins; PO_4 is used for ATP, DNA, and lipid membranes; iron is necessary for essential proteins)
4. 500 – Nutrients are often absent in the surface of the ocean, but they increase in concentration with depth – what is responsible for this increase? (remineralization due to consumption by grazers)
5. 400 – What is the primary source of nutrients to the ocean? (land via rivers)
6. 400 – What are diatom shells made out of? (silica)

Plankton

1. 100 - What are plankton? (drifters; organisms that cannot swim against currents)
2. 300 – What is an adaptation that some plankton have developed to reduce sinking? (spines, forming chains, elongate shape)
3. 500 – Name 3 vital services that marine phytoplankton provide to the planet (atmospheric oxygen, base of marine food web, pharmaceutical products, climate control)
4. 100 – What product can buried plankton develop into over millions of years? (petroleum/fossil fuels)
5. 400 – What is the difference between meroplankton and holoplankton? (Meroplankton, such as fish larvae, only spend part of their life cycle in the plankton, while holoplankton, such as copepods, spend their entire life cycle in the plankton)
6. 400 – What is the term given to the migration of plankton to the surface at night and to deep water during the day? (Vertical diurnal migration)

Circulation

1. 300 - What is the name for the region of sharp change in salinity with depth? (halocline)
2. 400 - What is the name for the density-driven circulation of the world's ocean? (thermohaline circulation)
3. 200 – In what part(s) of the world is deep water formed? (North Atlantic and Antarctica)
4. 300 – Name two processes that can affect the salinity profile of an area (evaporation, precipitation, ice formation/melting)
5. 200 – What direction do the trade winds blow? (from the NE, to the SW)
6. 200 – DAILY DOUBLE!! Spring tides are the name given to the most extreme tidal highs and lows. When do these tides occur? (full moon and new moon)
 - a. for 200 bonus points, what is the name for the other tides (neap)

Climate

1. 200 – Name two things that can increase the earth's albedo. Hint: albedo is related to the reflection of light. (snow, clouds)
2. 500 – How can increased CO₂ in the atmosphere spell disaster for corals, snails, and other organisms with calcium carbonate shells/skeletons? Hint: it's related to the pH of the ocean (increased CO₂ in water increases acidity – dissolves CaCO₃)
3. 100 – How do gases such as CO₂ and methane affect the temperature of the earth? (These are greenhouse gases that trap heat near the surface of the earth instead of allowing it to escape to space)
4. 700 – On the Keeling curve, what is responsible for annual variability in CO₂ levels? (Hint: The changes are related to the seasons) (In the northern hemisphere, trees absorb CO₂ in the spring and summer so the atmospheric CO₂ levels are low. In the fall/winter, the leaves fall and CO₂ is released back into the atmosphere.)

Phycology

1. 100 – Name a pigment used in photosynthesis (chlorophyll, carotenoid, phycobilin)
2. 300 - Name one species of seaweed (common or scientific name).
3. 300 – What are 3 potential uses of seaweed? (food, medicine, fertilizer, fishing lures)
4. 400 – What are the three major groups of seaweed? (brown algae, red algae, green algae)
5. 200 – In a kelp forest, grazing of seaweed by sea urchins is kept in check by what keystone species? (Sea otter)