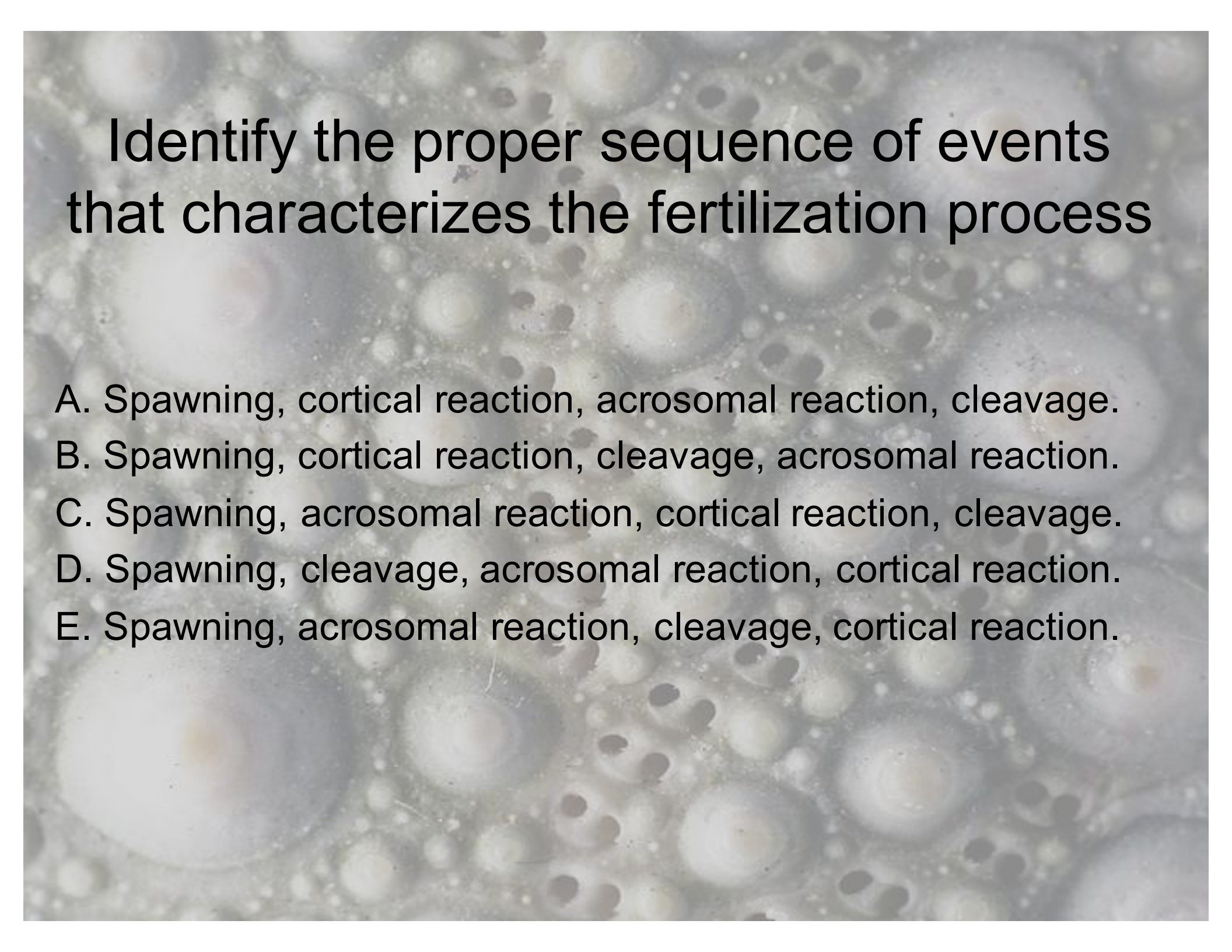


# RULES

- No eating, drinking, gum chewing in the classroom.
- Lunch area is outside the sliding doors within view.
- Don't wander around without checking with us.
- Wash your hands before you leave the lab.
- Wear shoes.
- Don't pour sea water down the drain. Empty sea water into a bucket and dispose outside.
- Do not drag scopes on the desk tops.
- Clean up before you leave the classroom.



Identify the proper sequence of events that characterizes the fertilization process

- A. Spawning, cortical reaction, acrosomal reaction, cleavage.
- B. Spawning, cortical reaction, cleavage, acrosomal reaction.
- C. Spawning, acrosomal reaction, cortical reaction, cleavage.
- D. Spawning, cleavage, acrosomal reaction, cortical reaction.
- E. Spawning, acrosomal reaction, cleavage, cortical reaction.

# What is the primary purpose of the fertilization envelope?

- A. It provides nutrients to the developing embryo.
- B. It protects the fertilized egg from being eaten by predators.
- C. It contains the DNA from both the egg and sperm.
- D. It prevents additional sperm from entering a fertilized egg.
- E. It stores the urchin's sperm and eggs until they are ready to spawn.

# Which of the following is false:

- A. During meiosis there are 2 cell divisions.
- B. The daughter cells of mitosis are genetically different from the parent cell.
- C. The final number of daughter cells of mitosis is 2 and of meiosis is 4.
- D. The final daughter cells of mitosis are diploid and of meiosis are haploid.
- E. The function of meiosis is to form gametes.

# Why are urchins important to coral reefs?

- A. They prevent algae from overgrowing the reef.
- B. They help to shade corals from intense sunlight.
- C. They improve seawater quality by filter feeding and removing bacteria.
- D. They are an important source of food and energy for corals.
- E. Their gametes are an important source of food for juvenile fish.

What would be your control experiment if you wanted to test the effect of increased salt concentration on fertilization?

- A. Monitor fertilization success in tap water.
- B. Monitor fertilization success in regular sea water.
- C. Monitor fertilization success in a mixture of sea water and tap water.
- D. Monitor fertilization success without water.
- E. NONE OF THE ABOVE

# Which of the following is an example of a poorly worded hypothesis?

- A. If sea urchin gametes are exposed to unusually high salt concentrations, then the fertilization rate will decrease.
- B. If pesticides are added to seawater with urchin sperm, then sperm motility will be slower.
- C. If sea urchin spawn is white, then the sea urchin is a male.
- D. ALL OF THE ABOVE
- E. NONE OF THE ABOVE

# Which of the following facts about urchin morphology is FALSE?

- A. The anus and mouth are separate openings.
- B. Gametes are expelled from 5 separate openings.
- C. They have teeth.
- D. All species of sea urchins have spines.
- E. Eggs and sperm are different colors.



A microscopic view of sea urchin eggs, showing numerous spherical cells of varying sizes and opacities. Some cells are more prominent and have a distinct yellowish-brown center, while others are smaller and more translucent. The background is a dense field of these cells, creating a textured, granular appearance.

Which of the following is true for a fertilized sea urchin egg?

- A. The egg becomes opaque when fertilized.
- B. The fertilization envelope is visible through the microscope.
- C. The sperm cell is visible inside the egg cell.
- D. The fertilized egg is haploid.
- E. It has completed the first cycle of mitosis.