

## Estuary Survival - Before you begin

<b>Your name</b>	Sam Crabby
<b>Common name of your animal</b>	Dungeness crab larvae
<b>Genus and species</b>	<i>Cancer magister</i>
<b>Size and other characteristics</b>	12mm across carapace – 1 <sup>st</sup> instar

Whether you are a Dungeness crab larvae or a Coho salmon smolt, life in the estuary can be risky but necessary business if you are to grow to be an adult and someday contribute your genetic material to the future of your kind. The game of estuary survival happens each year, with each passing day and with the rising and falling of the tides. What factors lead to a success story for an individual within a population of fish or crabs?

The class will play a game where each student will take on the role of an individual within a population attempting to beat the odds and survive another day in the estuary. Before you begin to play, answer these questions for your particular individual (represented by the game token).

1. Many different environmental conditions or factors come together to determine the health of a population of crabs, fish, or any organism in the estuary. These include water quality characteristics like temperature, salinity, turbidity, dissolved oxygen, and toxins. They may also include predation, habitat destruction, extreme weather events, and even climatic change. Describe the environmental factors that may influence the survival of your population of crabs or salmon.

Salinity – reduced salinity may cause the young crab to draw too much fresh water into its body, destroying the exoskeleton and killing the crab.

Dissolved oxygen (DO) – low levels of DO will not support the young crabs which are using gills to breathe. This may be caused by too much nutrient in the water from runoff.

2. What unique characteristics does your individual possess within the population?  
How are these characteristics advantageous?

Size – the 1<sup>st</sup> instar is small and able to avoid detection; this young stage of the crab is also almost clear which means it can blend into its surroundings.

3. How are these characteristics a disadvantage?

A small crab may be too slow to swim away from predators.

Round	Position	Habitat	Fate
1	A 6	Eelgrass – lower estuary	Survived a low tide by hiding in the eelgrass
2	A 6	Eelgrass – lower estuary	Survived attack by birds, too small to be seen
3	A 6	Eelgrass – lower estuary	Grew one size since estuary conditions were good at high tide
4	A 6	Eelgrass – lower estuary	Killed by oil spill in the lower estuary