**Modelling eDNA in a marine ecosystem – student worksheet**

**Ako: Learn about eDNA and how it can be used as a pest detector**

Environmental DNA is a tool that helps scientists monitor species, habitats and ecosystems. Mātauranga Māori and monitoring records often provide a baseline of a particular marine ecosystem. Using eDNA enables us to note changes to the ecosystem due to changes from land use or introduced species.

Water samples may contain eDNA from thousands of different species. This activity uses just a few:

* Northern Pacific sea star(*Asterias amurensis*)
* European shore crab(*Carcinus maenas*)
* killer algae(*Caulerpa taxifolia*)
* Mediterranean fanworm(*Sabella spallanzanii*)
* wakame(*Undaria pinnatifida*)
* cow (*Bos taurus*)
* pleated sea squirt(*Styela plicata*)
* blue cod(*Parapercis colias*)
* pine tree(*Pinus radiata*)
* common kelp(*Ecklonia radiata*)
* greenshell mussel(*Perna canaliculus*)

**Mahi:**

1. Take turns collecting eDNA sequence strips.
2. Match the eDNA sequence with the organism card. The DNA sequences are the complementary strands so you will need to use the base pairing rules (A pairs with T and G pairs with C) to find the correct species.
3. Collect the appropriate species token.
4. Consider how you will display the species data to communicate abundance – for example, place the tokens on the map where your water sample was collected from.

**Discussion questions**

1. Is there anything regarding species that looks unusual?
2. How may this eDNA have got there?
3. Can you identify the marine species that are introduced/pests?

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