Life's Diversity

Define the three main types of diversity
(i.e. genetic, species and ecosystem).

Simpson's Diversity Index (SDI) =

$$1 - \left(\frac{\sum n(n-1)}{N(N-1)} \right)$$

N=total number of organisms of all species
n=number of organisms of one species

Name:

Date:

Genetic Diversity: the diversity of GENES

Genotype for Skin colour (in one species of fish)	Abundance (n)	n(n-1)
GGAATTCA	3	6
GGAATTCC	2	2
GAATTCCC	1	0
ATTTTCCC	1	0
Total	N = 7	∑n(n-1) = 8
Simpsons Index Calculations	N(N-1) = 42	1-[8/42]=**0.81**

Genetic diversity is the diversity of genes in one species. The greater the diversity, the greater chance of adapting to change and avoiding extinction. *Note*: SDI can range from 0 (no diversity) to 1 (infinite diversity). Thus, closer to 1 is better. In this case, the SDI is **0.81**, so it is considered relatively diverse ☺ with a likely chance of survival.

Species Diversity: the diversity of SPECIES

Species	(n)	n(n-1)
Sabella spallanzanii (introduced)	20	
Sabellastarte australiensis (native)	1	
Phoronsis australis (native)	1	
Total	N =	∑n(n-1) =
Simpsons Index Calculations	N(N-1) =	1-(/)=

Species diversity is the diversity of species in an ecosystem. The greater the diversity, the healthier and more resilient the ecosystem. *Species richness* is the number of rows. More rows, more diversity. In this case, the species richness is low. Hence the SDI will be close to zero.
Activity: Calculate SDI

Ecosystem Diversity: the diversity of ECOSYSTEMS

Ecosystems	(n)	n(n-1)
Coral Reef	20	
Estuary	25	
Sandy Beach	30	
Total	N =	∑n(n-1) =
Simpsons Index Calculations	N(N-1)=	1-(/)=

Ecosystem diversity is the diversity of ecosystems. The greater the diversity, the more habitat diversity for more species to occupy. *Note*: *Species evenness* is the balance of 'n'. The more evenly balanced, the more diversity.
Activity: Calculate SDI

Q. What is the _species_ diversity (SDI) of your school grounds (or part of). Ans.