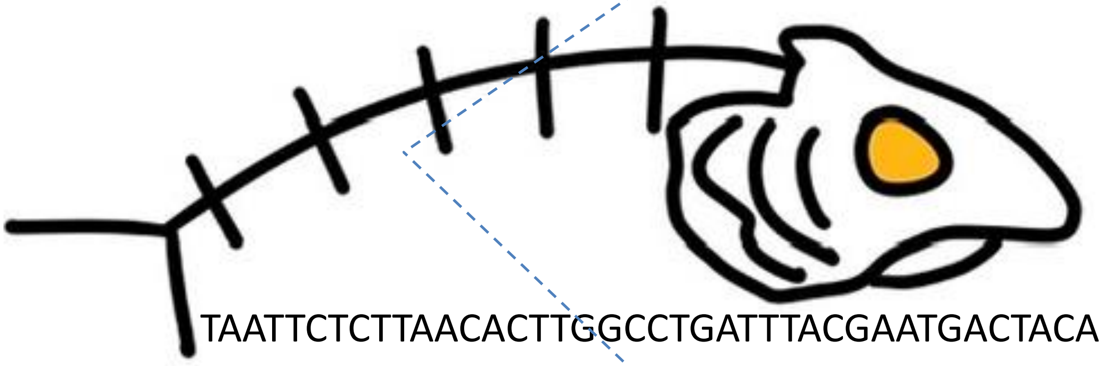
Handout 1. Fish to Cut Out

CATAGTGCATATATGTATTTACACCATACATATATATTAAACAT



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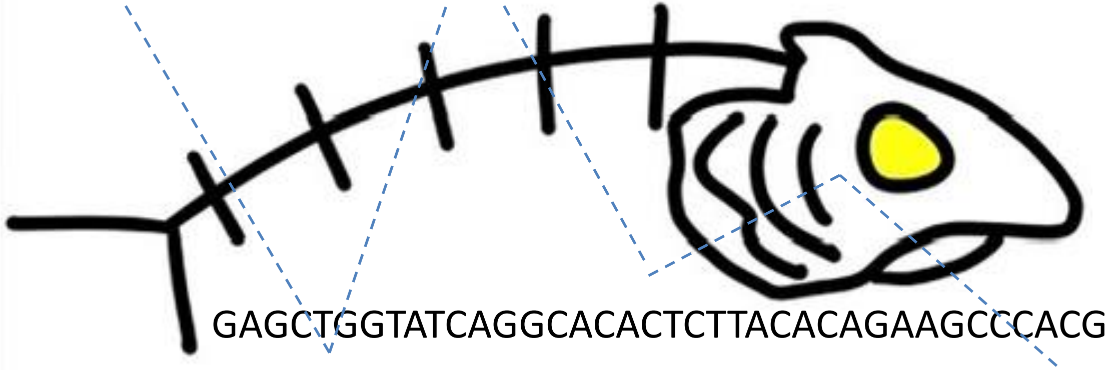

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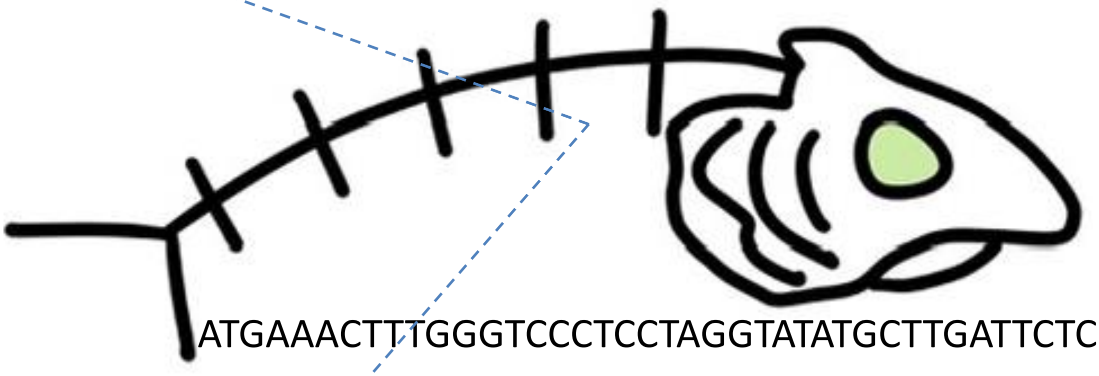
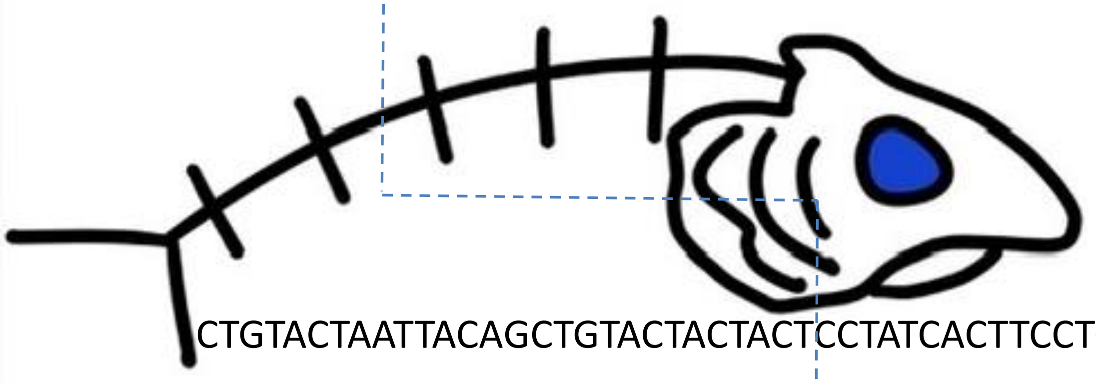
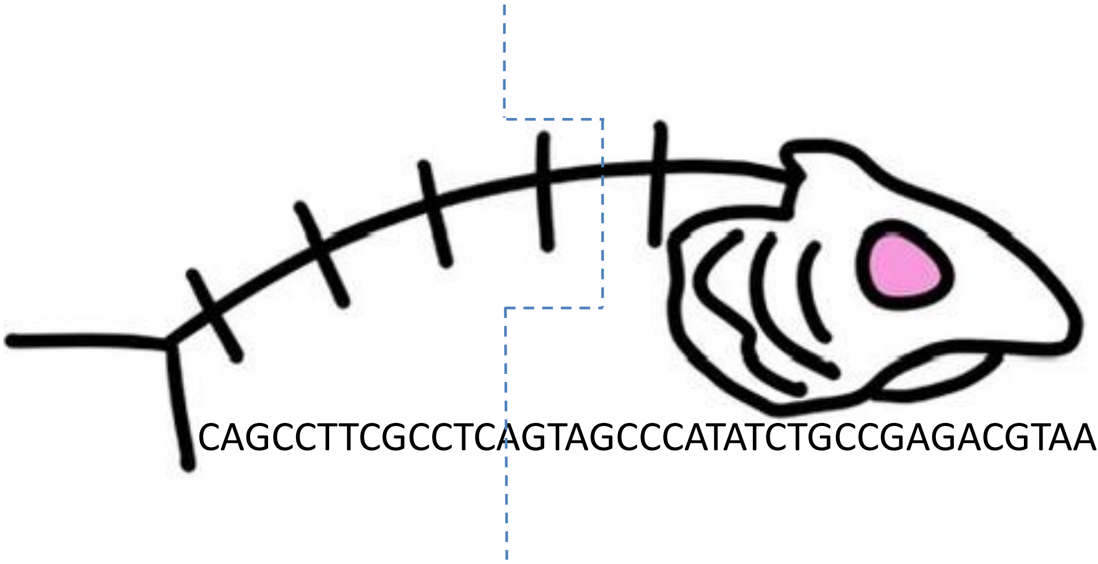


ATGAAACTTTGGGTCCCTCCTAGGTATATGCTTGATTCTCCA

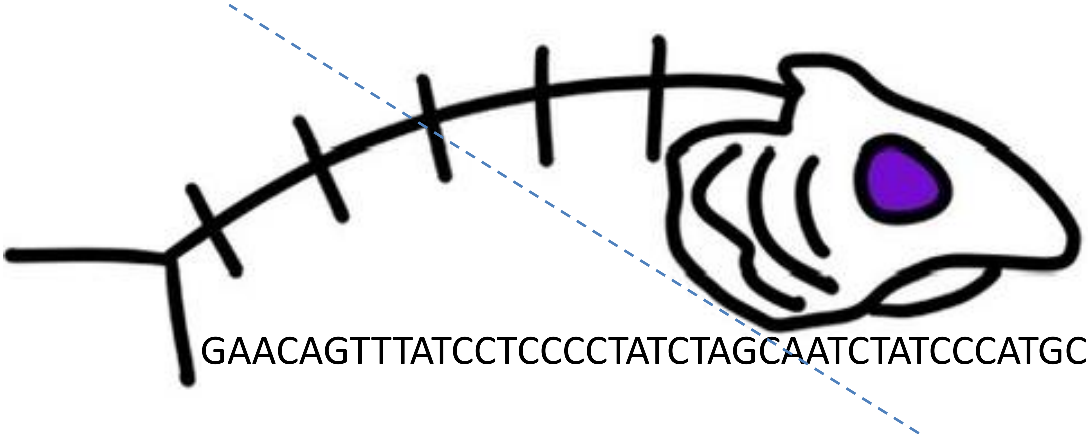
TCTTCTTTATCTGCATCTACCTACACATCGGACGAGGCCTAT



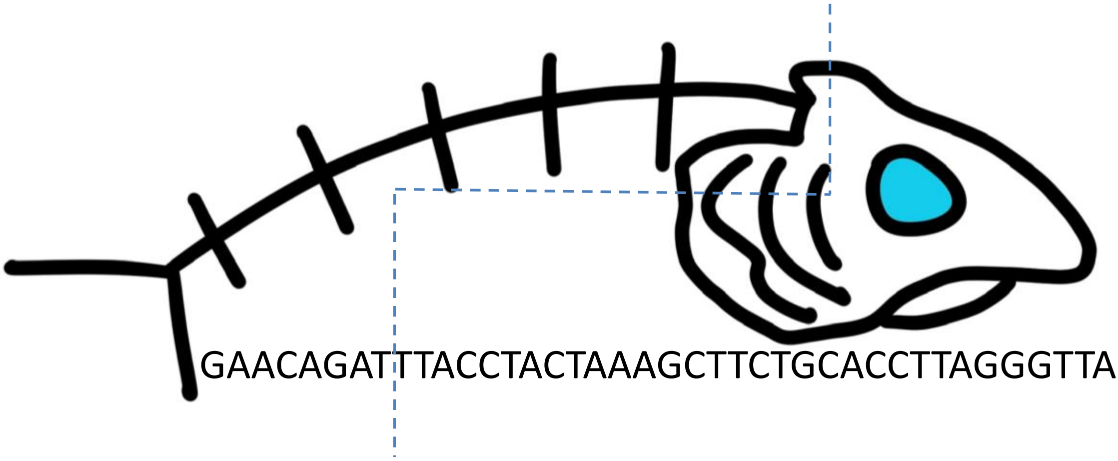
CTGTACTAATTACAGCTGTACTACTACTCCTATCACTTCCTGT



CAGCCTTCGCCTCAGTAGCCCATATCTGCCGAGACGTAAAC



GAACAGTTTATCCTCCCCTATCTAGCAATCTATCCCATGCAGG



GAACAGATTTACCTACTAAAGCTTCTGCACCTTAGGGTTACTTTAA

Worksheet 1. Student Worksheet

Name
Assessment
Class period

Date
Eye color of organism

1. What is the DNA sequence you picked?

NCBI BLAST website: https://blast.ncbi.nlm.nih.gov/Blast.cgi

Go to NCBI GenBank, nucleotide BLAST. Search the sequence and answer the following questions:

2. What is the first scientific name that comes up? They are in the second column.

3. Are the first three scientific names the same species?

4. Keep scrolling down the page. Are there other species listed that are different from the top result? If not, list the English common name of your species. If yes, list the other scientific names and determine the English common name for those species, in addition to your species.

5. If there are other species that are listed in the results, why do you think the results show other species besides the correct species identification?

6. How can using DNA and genetics be useful in learning about the food web?

Worksheet 2. Advanced Student Worksheet Supplement – use the DNA sequence from the organism in Worksheet 1

Name	Assessment	Class period
Date	Eye color of organism	

1. What is the transcribed sequence? (DNA to RNA)

2. What is the translated sequence? (RNA to protein)

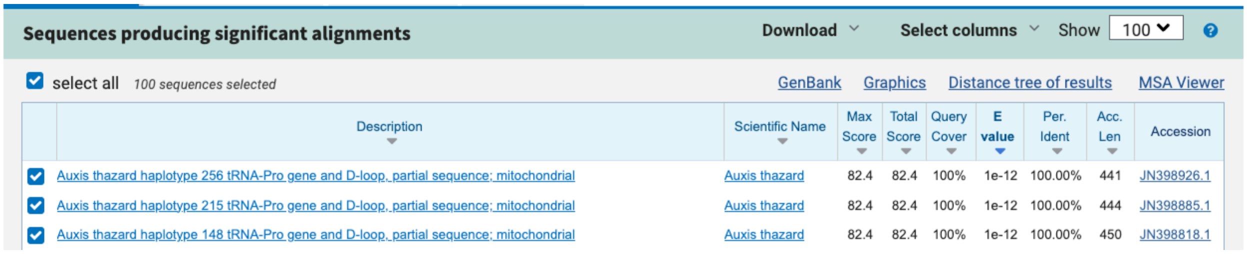
Go to NCBI GenBank, <u>protein</u> BLAST. Search the protein sequence and answer the following questions:

3. What are the first three proteins that come up?

4. Pick one of them. Click on one of the description rows with the name of the protein (first column). What is the Query sequence and the Subject of the protein?

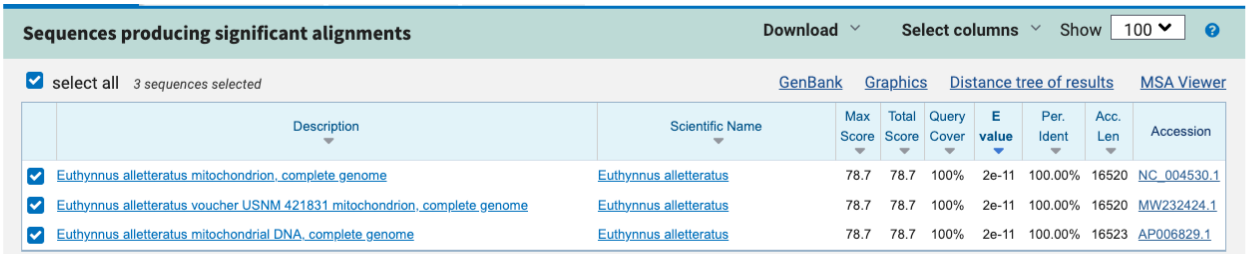
5. For the protein you picked, what is the main function of this gene? Tip: use www.uniprot.org or https://www.ebi.ac.uk/interpro/entry/InterPro/#table to learn more about the protein. Google scholar is also a good source to find information about proteins.

6. In these searches, there are likely new vocabulary words. List three of them and provide the definition.



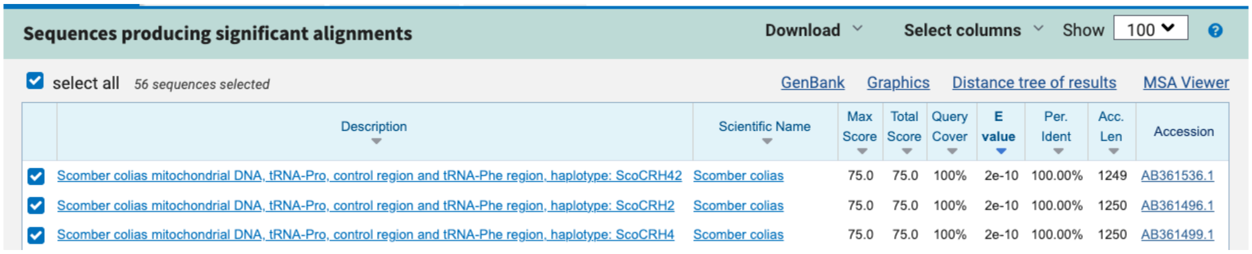
	Description	Scientific Name	Max Score	Total Score	Query Cover	E value	Per. Ident	Acc. Len	Accession
☑	Auxis thazard haplotype 256 tRNA-Pro gene and D-loop, partial sequence; mitochondrial	Auxis thazard	82.4	82.4	100%	1e-12	100.00%	441	JN398926.1
☑	Auxis thazard haplotype 215 tRNA-Pro gene and D-loop, partial sequence; mitochondrial	Auxis thazard	82.4	82.4	100%	1e-12	100.00%	444	JN398885.1
☑	Auxis thazard haplotype 148 tRNA-Pro gene and D-loop, partial sequence; mitochondrial	Auxis thazard	82.4	82.4	100%	1e-12	100.00%	450	JN398818.1

Orange species:



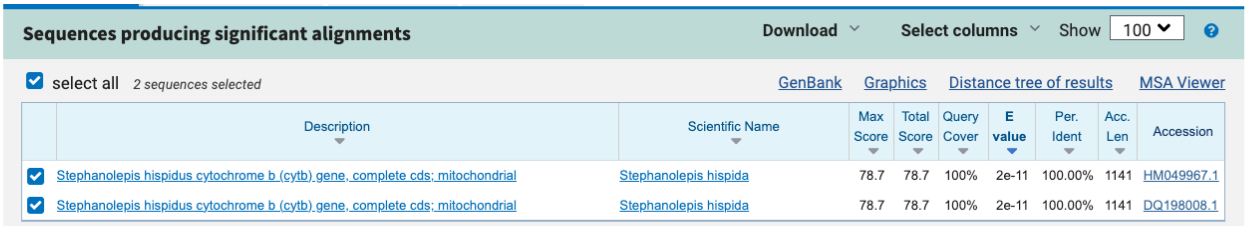
	Description	Scientific Name	Max Score	Total Score	Query Cover	E value	Per. Ident	Acc. Len	Accession
☑	Euthynnus alletteratus mitochondrion, complete genome	Euthynnus alletteratus	78.7	78.7	100%	2e-11	100.00%	16520	NC_004530.1
☑	Euthynnus alletteratus voucher USNM 421831 mitochondrion, complete genome	Euthynnus alletteratus	78.7	78.7	100%	2e-11	100.00%	16520	MW232424.1
☑	Euthynnus alletteratus mitochondrial DNA, complete genome	Euthynnus alletteratus	78.7	78.7	100%	2e-11	100.00%	16523	AP006829.1

Yellow species:



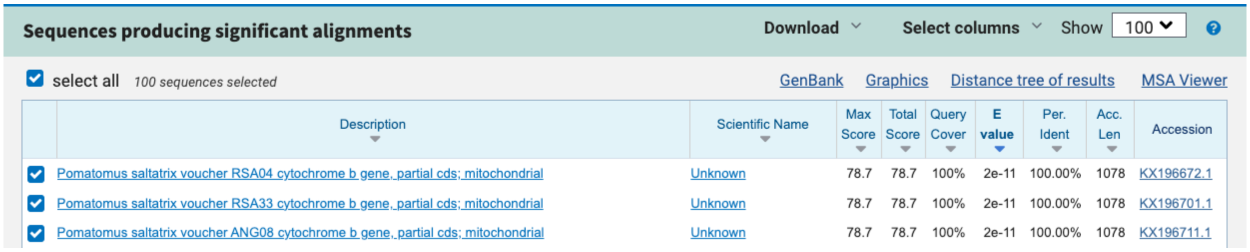
	Description	Scientific Name	Max Score	Total Score	Query Cover	E value	Per. Ident	Acc. Len	Accession
☑	Scomber colias mitochondrial DNA, tRNA-Pro, control region and tRNA-Phe region, haplotype: ScoCRH42	Scomber colias	75.0	75.0	100%	2e-10	100.00%	1249	AB361536.1
☑	Scomber colias mitochondrial DNA, tRNA-Pro, control region and tRNA-Phe region, haplotype: ScoCRH2	Scomber colias	75.0	75.0	100%	2e-10	100.00%	1250	AB361496.1
☑	Scomber colias mitochondrial DNA, tRNA-Pro, control region and tRNA-Phe region, haplotype: ScoCRH4	Scomber colias	75.0	75.0	100%	2e-10	100.00%	1250	AB361499.1

Light Green species:



	Description	Scientific Name	Max Score	Total Score	Query Cover	E value	Per. Ident	Acc. Len	Accession
☑	Stephanolepis hispidus cytochrome b (cytb) gene, complete cds; mitochondrial	Stephanolepis hispida	78.7	78.7	100%	2e-11	100.00%	1141	HM049967.1
☑	Stephanolepis hispidus cytochrome b (cytb) gene, complete cds; mitochondrial	Stephanolepis hispida	78.7	78.7	100%	2e-11	100.00%	1141	DQ198008.1

Dark Green species:



	Description	Scientific Name	Max Score	Total Score	Query Cover	E value	Per. Ident	Acc. Len	Accession
☑	Pomatomus saltatrix voucher RSA04 cytochrome b gene, partial cds; mitochondrial	Unknown	78.7	78.7	100%	2e-11	100.00%	1078	KX196672.1
☑	Pomatomus saltatrix voucher RSA33 cytochrome b gene, partial cds; mitochondrial	Unknown	78.7	78.7	100%	2e-11	100.00%	1078	KX196701.1
☑	Pomatomus saltatrix voucher ANG08 cytochrome b gene, partial cds; mitochondrial	Unknown	78.7	78.7	100%	2e-11	100.00%	1078	KX196711.1

Dark Blue species: