

Secțiunea a III-a

RECOMANDĂRI PRIVIND RESURSE EDUCATIONALE DESCHISE

Resurse digitale

<https://www.youtube.com/watch?v=hLyGg-pC8mM> Acizii nucleici – Telescoala, TVR2

<https://www.youtube.com/watch?v=zNy4EQRAAsA0> Acizii nucleici, compoziție chimică, structură, funcții – Telescoala, TVR 2

<https://www.youtube.com/watch?v=-8MP9lw1SFk&t=21s> Organizarea materialului genetic la virusuri, procariote, eucariote – Telescoala, TVR2

http://www.tvr.ro/tele-coala-biologie-a-xii-a-genetica-umana-i-acizi-nucleici-video_29903.html

Genetică umană și acizi nucleici- Telescoala, TVR 2

http://www.tvr.ro/tele-coala-biologie-a-xii-a-ecologie-umana-video_26663.html Ecologie umană - Telescoala, TVR2

<https://www.youtube.com/watch?v=hmnK9BXCP0I> Test de antrenament pentru bacalaureat, Telescoala, TVR2

https://www.youtube.com/watch?v=WupJFy4J_cQ Test de antrenament Bacalaureat, Telescoala, TVR2

<https://www.youtube.com/watch?v=RsGsT6wDUzo> Test de antrenament, Bacalaureat, Telescoala, TVR2

<https://www.youtube.com/watch?v=mo7CBwpwldo> Test de antrenament, Bacalaureat, Telescoala

<https://www.youtube.com/watch?v=eAGZKsIqqUs> Replicarea ADN-funcția autocatalitică

<https://www.youtube.com/watch?v=TNKWgcFPHqw> Replicarea ADN-funcția autocatalitică

<https://www.youtube.com/watch?v=gG7uCskUOrA> Modelul nucleosomal; ADN- funcția heterocatalitică

<https://www.youtube.com/watch?v=DbR9xMXuK7c> Amprentarea AND

https://www.youtube.com/watch?v=JcUQ_TZCG0w Experimentul Meselson – Stahl

<https://www.youtube.com/watch?v=matsiHSuoOw> Reacția PCR

Alte resurse educaționale utile în realizarea demersului didactic pot fi consultate la adresa:

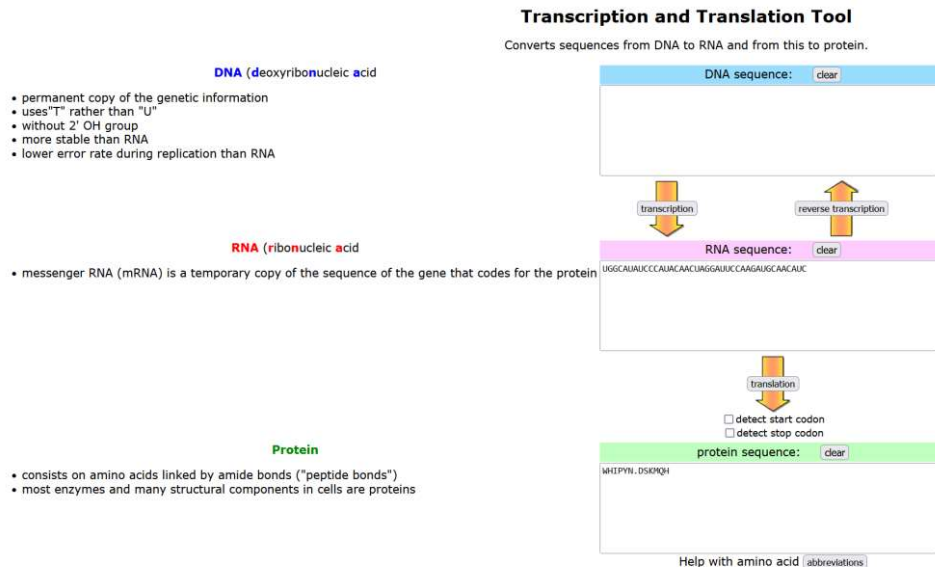
<https://digital.educd.ro/resurse-educationale>

EXEMPLE DE ACTIVITĂȚI

1. Platforma experimentală: <https://biomodel.uah.es/en/lab/cybertory/analysis/trans.htm>

* nu necesită crearea unui cont

* se poate accesa de pe telefon



Exemplu de activitate:

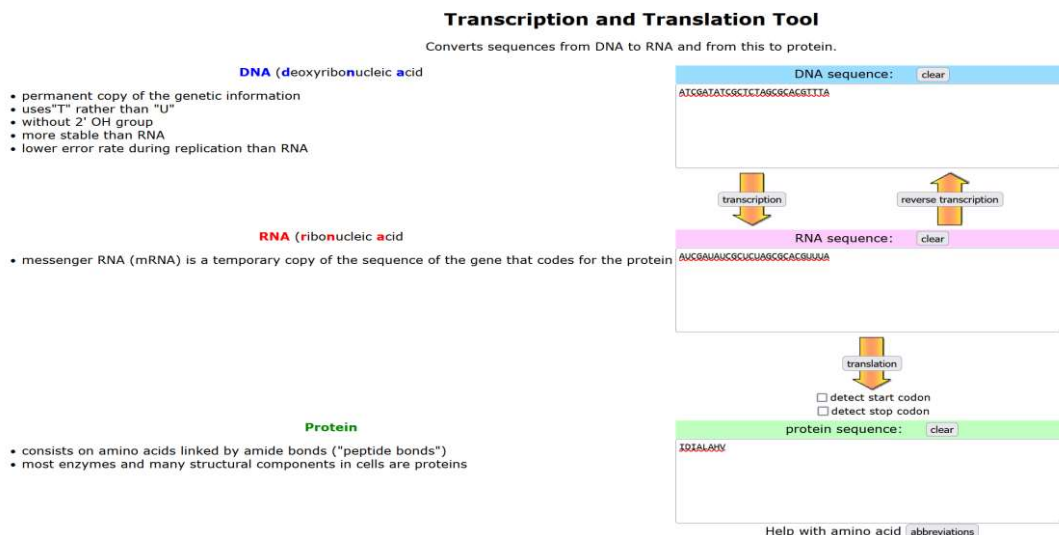
Unitatea de învățare: Sinteza proteinelor

Problema: Care este legătura dintre ADN, ARN și proteine?

CG. 3 Utilizarea și construirea de modele și algoritmi în scopul demonstrării principiilor lumii vii

Descrierea activității:

Elevii vor introduce la alegere baze azotate, și vor observa ce se obține în urma procesului de transcripție și translație. Se va utiliza meniul *abbreviations* pentru identificarea aminoacizilor. După identificarea secvenței de aminoacizi, elevii vor modifica un codon/ bază azotată și vor analiza noua secvență de aminoacizi. Comparând cele două secvențe, se va discuta importanța cunoașterii codului genetic și a unui sistem de traducere din limbajul acidului nucleic în limbaj proteic.



2. Platforma experimentală:

<https://www.labxchange.org/library?t=Language%3Aen&t=ItemType%3ASimulation&t=Partner%3Alabxchange&page=1&size=24&order=relevance>

* crearea contului este gratuită, dar activitățile interactive pot fi accesate și fără cont



SIGN UP. IT'S FREE!
Sign up with an email address or edX account.

You must be 13 or older to sign up for a LabXchange account.

By creating an account, you agree to the [Terms of service](#), and you acknowledge that LabXchange processes your personal data in accordance with the [Privacy notice](#).

Already have an account? [Sign in](#)

Permite alegerea mai multor activități, pe diferite domenii:

Recommended

Biology Physics Chemistry

Simulation Orange Juice

pH 3.75

pH Scale

Overview Launch ▶

Simulation

Acid-Base Solutions

Overview Launch ▶

Simulation

Hydrogen Bonds: A Special Type of...

Overview Launch ▶

Simulation

Diffusion Across a Permeable Membrane

Overview Launch ▶

Explore by content type

Simulations	Interactives	Pathways
Case studies	Clusters	Videos
Question sets	Teaching guides	Annotated videos NEW

Permite modificarea anumitor materiale și proiectarea de lecții și teste de tip quizz:

Customize existing lessons

Remix and customize pre-made learning pathways to meet your students' needs.
Or create your own lessons with a free educator account.

[More pathways](#)



Cells
LabXchange

This pathway covers

- Key Terms Related to Cell Structure T TEXT
- Inner Life of the Cell with Music VIDEO
- What Is a Cell? T TEXT

[+12 more](#)

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Quick links

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 **View subjects & topics**

 **Design your own lesson**
(requires a free account)

 **Create a class**
(requires a free account)

 **Create a quiz**
(requires a free account)

Exemplu de activitate:

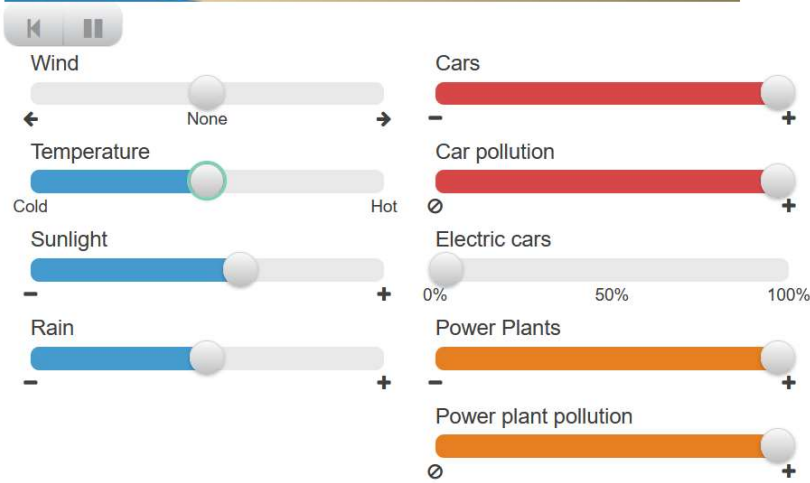
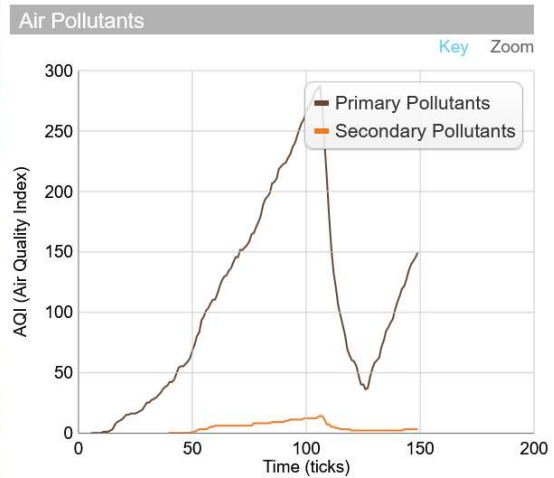
Unitatea de învățare: Impactul antropic asupra ecosistemelor naturale

Problema: Cum poluam mediul?

CG. 3 Utilizarea și construirea de modele și algoritmi în scopul demonstrării principiilor lumii vii

Descrierea activității:

Utilizând telefoanele, elevii realizează simularea de pe platformă, analizează și graficul legat de calitatea aerului. Pornind de la observațiilor lor, se inițiază o activitate de tip brainstorming legată de efectul activității umane asupra ecosistemelor naturale, precum și raportul efect antropic/distanța față de așezările umane.

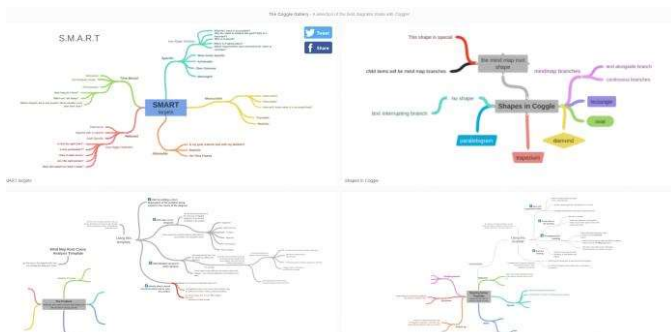


3. Platformă resursă pentru realizarea unei scheme de tip harta minții: <https://coggle.it/>

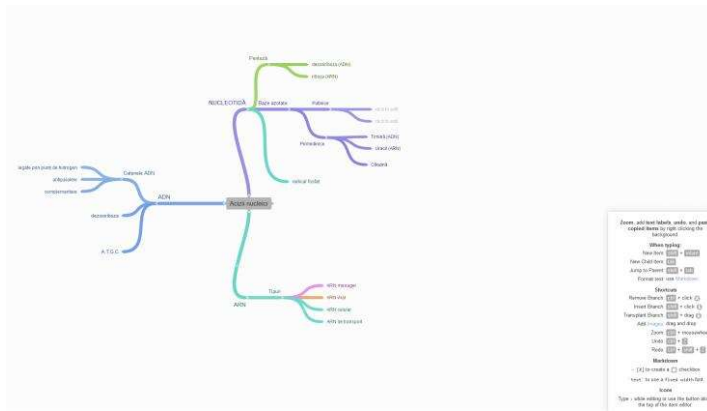
* crearea contului este gratuită; se poate accesa și de pe telefon



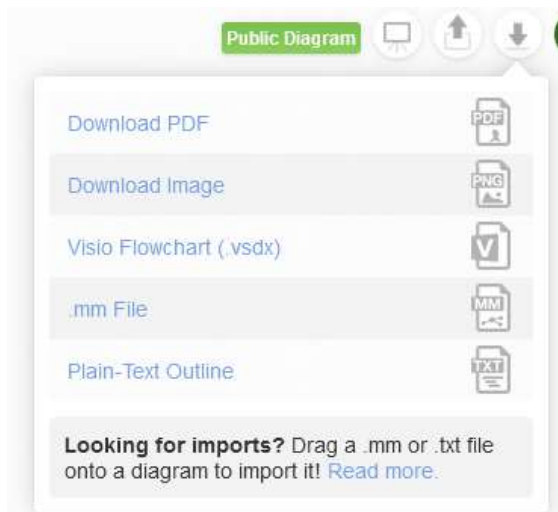
Se pot realiza diagrame sau pot sa fie accesate cele marcate cu opțiunea *public diagram*:



În meniul de realizare a diagramelor se regăsește un submeniu cu instrucțiuni de ajutor:



Diagramele se pot descărca sub mai multe forme:



4. Platformă experimentală de tip laborator virtual de imunologie:
<https://www.biointeractive.org/classroom-resources/immunology-virtual-lab>

*simulările pot fi accesate fără cont

Immunology Virtual Lab

Start Interactive

Topic

Biochemistry & Molecular Biology

- Enzymes & Reactions
- Biotechnology

Level

High School — General

High School — AP/IB

College

Anatomy & Physiology

- Immune System

Saved By

- 99 Members

Resource Type

Interactive Media

- Virtual Labs

Description

This interactive, modular lab explores how the ELISA method can be used to test blood samples for evidence of certain diseases.

The enzyme-linked immunosorbent assay (ELISA) is a laboratory technique that detects and measures specific proteins. It can show whether a patient has antibodies related to certain diseases, making it useful for medical diagnoses. In this lab, students perform a virtual ELISA to test whether a particular antibody is present in a blood sample. Students engage in key science practices, including experimental design and data interpretation.

The lab contains an interactive lab space, an informational notebook, and embedded questions. It also includes supplementary resources, such as a glossary of scientific terms.

The accompanying worksheet provides structure and guidance as students perform the tutorials and experiments in the lab.

The "Resource Google Folder" link directs to a Google Drive folder of resource documents in the Google Docs format. Not all downloadable documents for the resource may be available in this format. The Google Drive folder is set as "View Only": to save a copy of a document in this folder to your Google Drive, open that document, then select File → "Make a copy." These documents can be copied, modified, and distributed online following the Terms of Use listed in the "Details" section below, including crediting Biointeractive.

[Show less](#)

Student Learning Targets

- Explain how testing for antibodies can inform a medical diagnosis.
- Describe the purpose, procedure, and potential limitations of an ELISA.

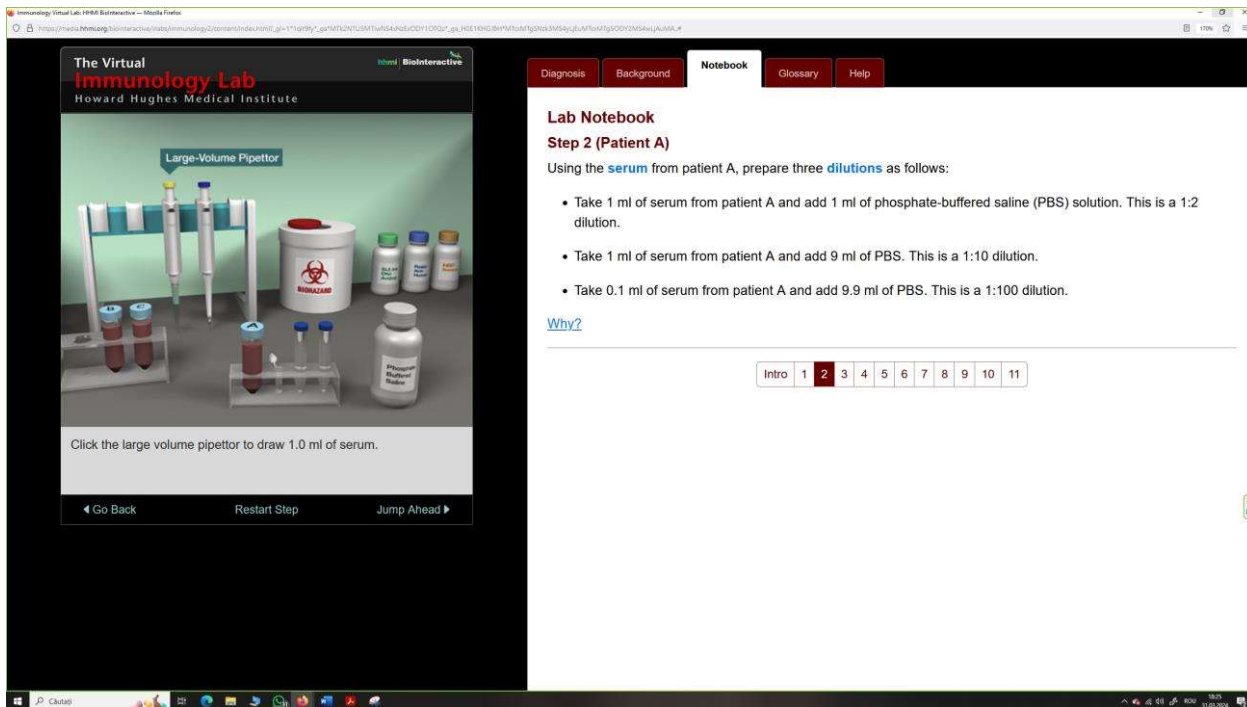
Materials

- [Resource Google Folder \(link\)](#)
- [Worksheet \(PDF\) 69 KB](#)

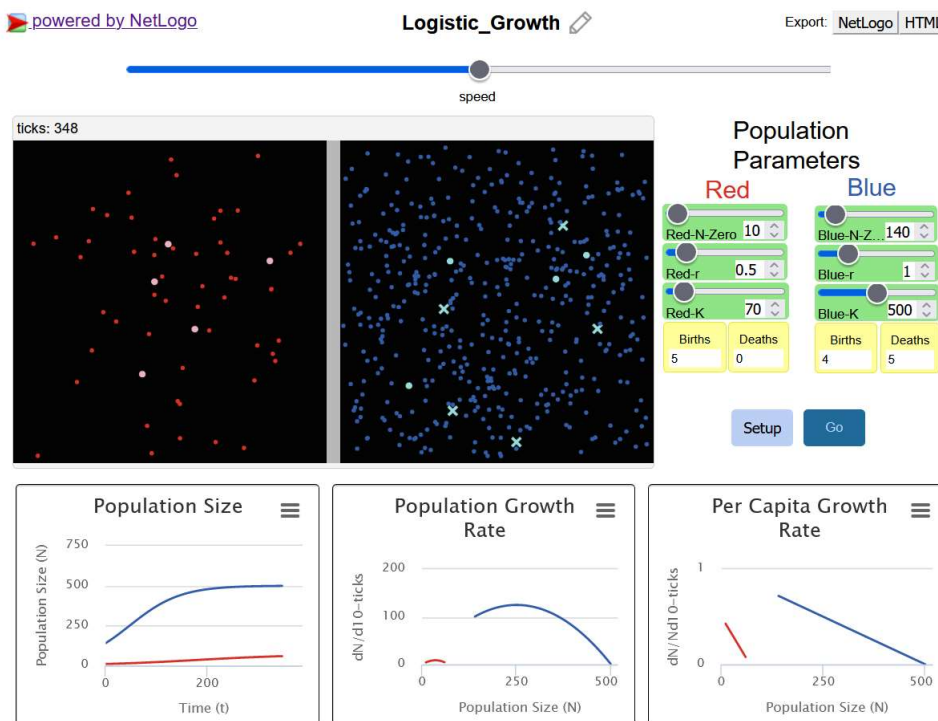
Related Science News

[2 types of testing look for COVID-19 infections new and old](#)

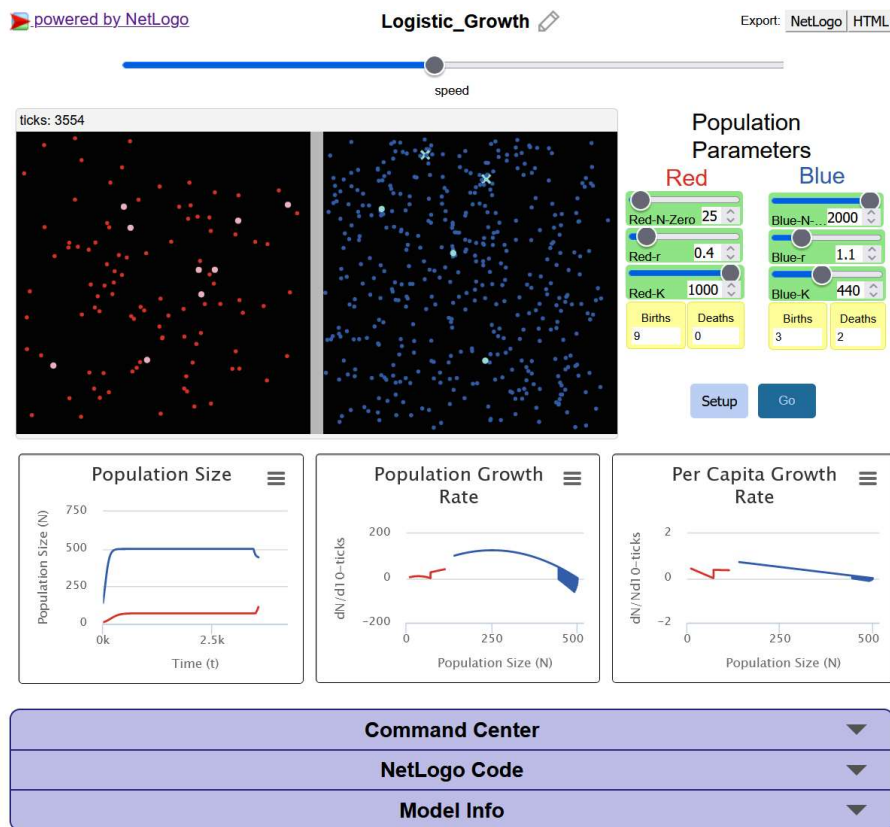
Permite parcurgerea virtuală a unui protocol de lucru pentru identificarea unor afecțiuni pe baza răspunsului imun (ex. testul ELISA)



5. Platformă experimentală de tip simulare virtuală evoluția unei populații : https://virtualbiologylab.org/NetWebHTML_FilesJan2016/LogisticGrowthModel.html



Permite modificarea parametrilor și oferă informații legate de modalitatea de calcul a parametrilor (submeniul *model info*):



6. Platformă experimentală: https://nt7-mhe-complex-assets.mheducation.com/nt7-mhe-complex-assets/9-12_SciMar-20-2018/Biology/BL_26/index.html

* nu necesită crearea unui cont și se poate accesa de pe telefon

VIRTUAL LABS

DNA and Genes
How do point mutation and frameshift mutation impact genetic sequences?

Step 2 — Construct the mutated or original sequence by dragging nucleotides and amino acids to their new locations. Click a nucleotide or amino acid to remove it.

Step 3 — Use the information on the Amino Acids Chart to identify the nucleotides and amino acids associated with the mRNA sequence created.

Step 4 — Click the Check Button to see if you have correctly created the mRNA and protein sequences.

Step 5 — Answer journal questions 1 - 4 for each sequence you create, and then answer the remaining questions.

Step 6 — Click the Mutate Button to

Journal Calculator Table

Original Sequence

Mutated Sequence

Mutate Check Reset

Nucleotides

Adenine Guanine Cytosine Uracil

Amino Acids

Alanine Arginine Asparagine Cysteine Glutamic acid
Glutamine Glycine Histidine Isoleucine Leucine
Lysine Methionine Phenylalanine Proline Serine
Threonine Tryptophan Tyrosine Valine "Stop" codon

Mutation Rules

Insert A in front of 4th C

Amino Acid Chart Mutation Guide

Pornind de la secvența inițială, elevii pot să „inducă” mutații:

DNA and Genes

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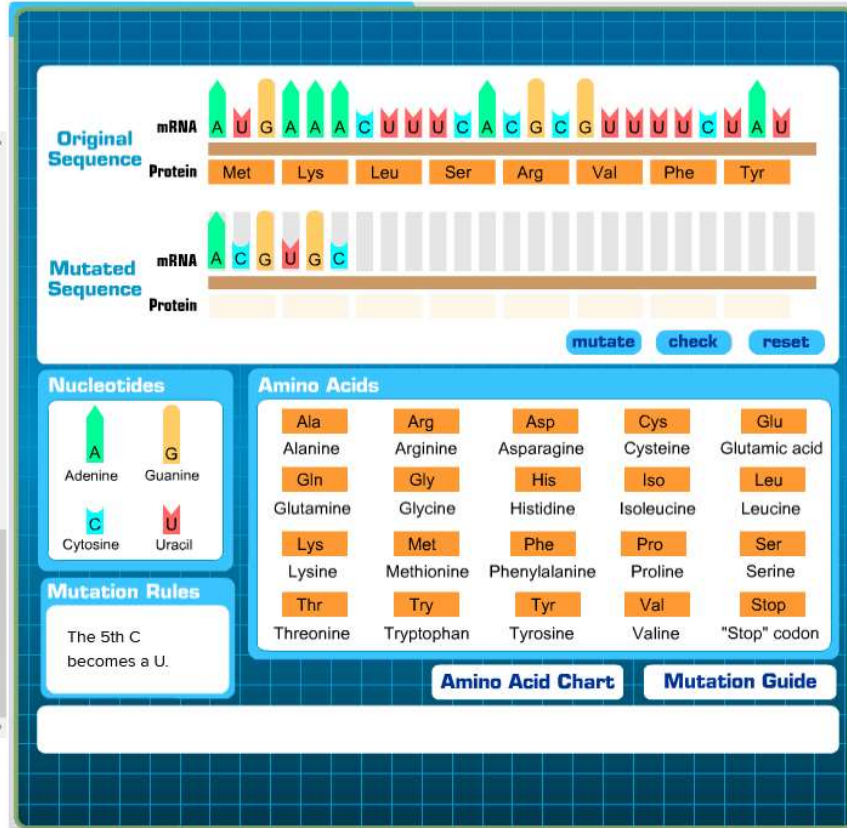
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Step 4 — Click the Check Button to see if you have correctly created the mRNA and protein sequences.

Step 5 — Answer journal questions 1 - 4 for each sequence you create, and then answer the remaining questions.

Step 6 — Click the Mutate Button to generate another sequence.

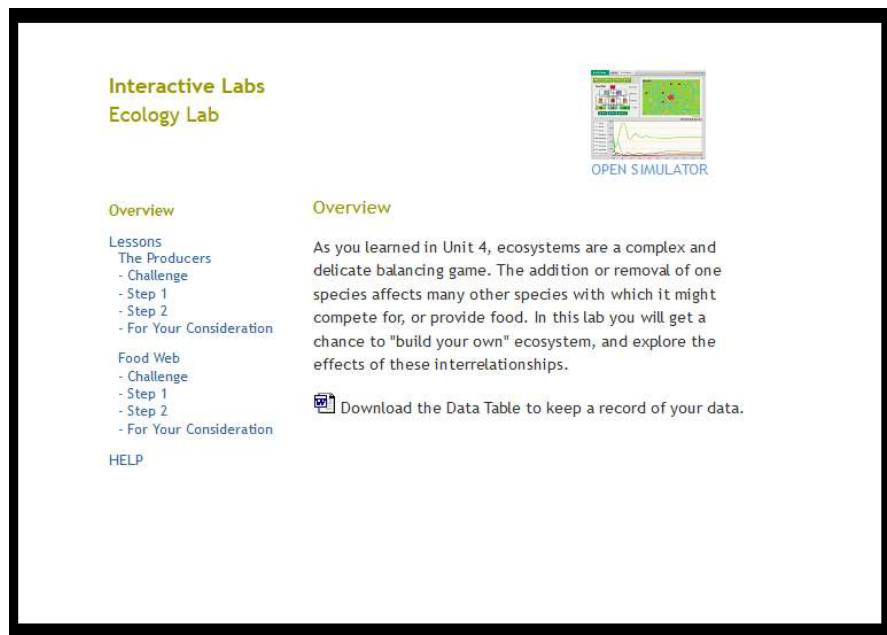
Journal Calculator Table



7. Platformă interactivă pentru studiul relațiilor trofice într-un ecosistem:

<https://www.learner.org/wp-content/interactive/envsci/ecology/index.html>

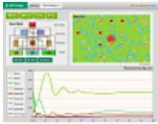
* nu necesită crearea unui cont și se poate accesa de pe telefon



Se poate descărca un document cu un tabel în care elevii vor completa rezultatele obținute în urma simulării și o casetă de răspuns liber pentru notarea concluziilor. Documentul este în Limba Engleză și permite editarea:

Interactive Labs

Ecology Lab



[OPEN SIMULATOR](#)

Overview

Lessons

- The Producers
 - Challenge
 - Step 1
 - Step 2
 - For Your Consideration
- Food Web
 - Challenge
 - Step 1
 - Step 2
 - For Your Consideration

[HELP](#)

Overview

As you learned in Unit 4, ecosystems are a complex and delicate balancing game. The addition or removal of one species affects many other species with which it might compete for, or provide food. In this lab you will get a chance to "build your own" ecosystem, and explore the effects of these interrelationships.

 [Download the Data Table to keep a record of your data.](#)

Deschiderea simulării se realizează prin accesarea opțiunii *open simulator*:

Interactive Labs

Ecology Lab



[OPEN SIMULATOR](#)

Overview

Lessons

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 - Challenge
 - Step 1
 - Step 2
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- Food Web
 - Challenge
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[HELP](#)

Overview

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Pornind de la parametrii stabiliți, se realizează legăturile trofice în sistem și se pornește simularea: