



# THE GLOBE PROGRAM

A Worldwide Science and Education Program

## Primjena GLOBE protokola u vrtiću i razrednoj nastavi

Edukacija za odgojitelje i učitelje od 1. do 5. razreda  
OŠ Leskovec pri Krškem 27.11.2023.

Snježana Marković – Zoraja, učitelj savjetnik

smzoraja566@gmail.com

Ankica Veseljić, učitelj savjetnik

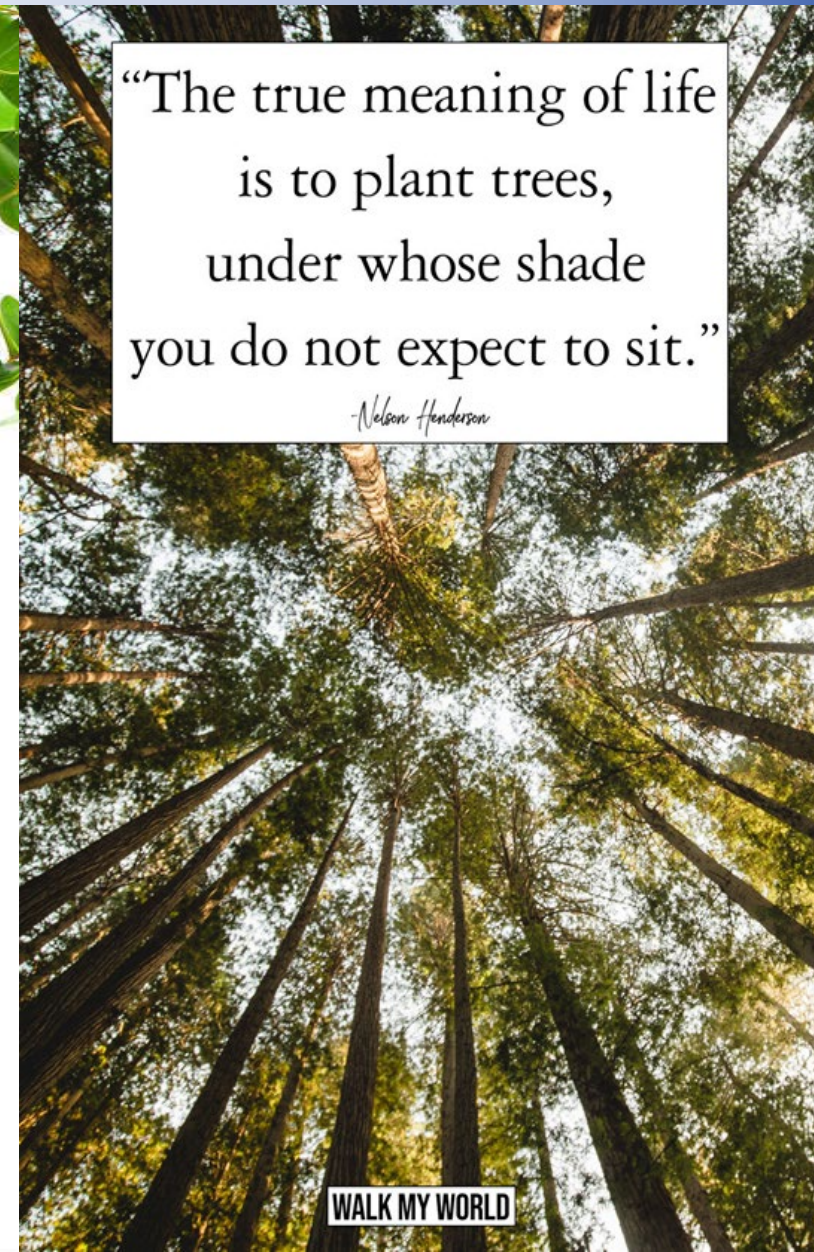
aveseljic@gmail.com



## Biometrija i Fenologija

“The true meaning of life  
is to plant trees,  
under whose shade  
you do not expect to sit.”

*-Nelson Henderson*





# THE GLOBE PROGRAM

A Worldwide Science and Education Program

**An Apple Tree through the Seasons of the Year** NAME \_\_\_\_\_

Color the pictures of the apple tree. Above each tree, write the season that is shown: **Spring, Summer, Fall, or Winter.**

 The apple tree is in bloom.	 The apple tree is full of beautiful green leaves.
 The apple tree is full of apples.	 The leaves have fallen off the tree.

Copyright ©1999 Barbara Lanning Rothman  
This page may be printed for personal educational use only.

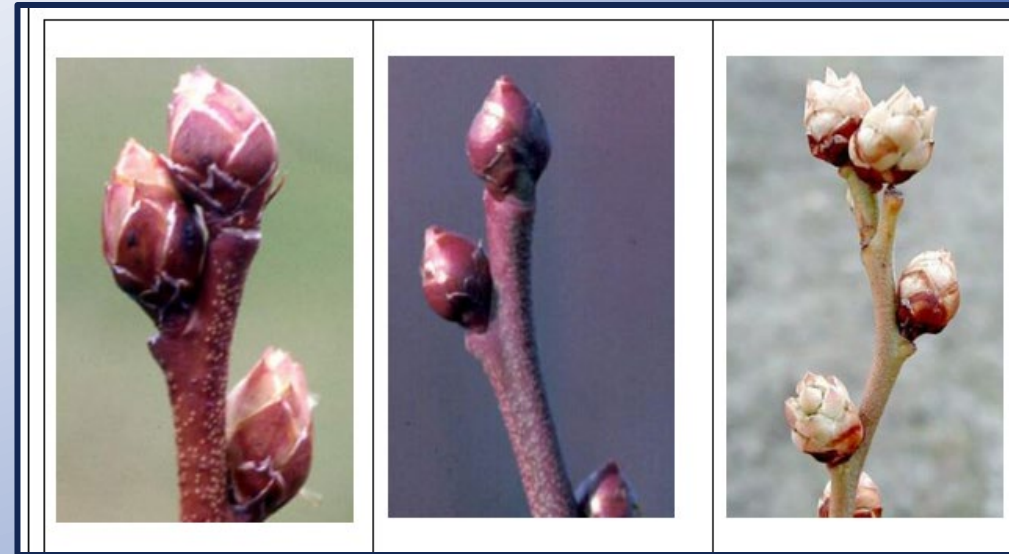


مدرسة جيه ام ان الخاصة  
JSS PRIVATE SCHOOL

Name: \_\_\_\_\_ Class: \_\_\_\_\_ Date: \_\_\_\_\_

Choose the correct season

summer	winter	autumn	spring
			<input type="text"/>
			<input type="text"/>
			<input type="text"/>
			<input type="text"/>



## Aktivnosti:

- prepoznavanje sezonskih promjena u prirodi, zapažanje i bilježenje promjena
- istraživanje ciklusa rasta i razvoja biljke
- prepoznavanje početka ciklusa razvoja listova i praćenje rasta listova
- crtanje pupova i listova
- uspoređivanje početka pupanja među različitim biljnim vrstama
- razumijevanje povezanosti razvoja biljaka sa stanjem u okolišu



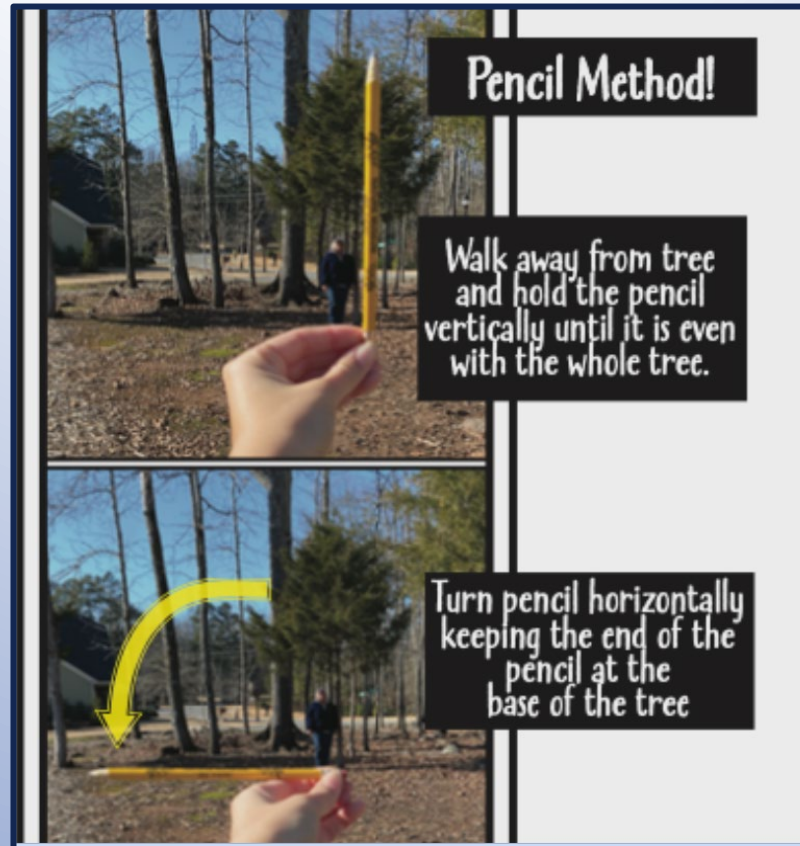
# THE GLOBE PROGRAM

A Worldwide Science and Education Program









### Aktivnosti:

- mjerenje visine drveća jednostavnim metodama
- prepoznavanje različitih vrsta drveća
- sadnja drveća i praćenje rasta drveta
- razumijevanje povezanosti rasta drveta sa stanjem u okolišu
- zapažanje i bilježenje promjena u okolišu
- razvijanje odgovornog odnosa čovjeka prema sebi i prirodi.



# THE GLOBE PROGRAM

A Worldwide Science and Education Program



**Pencil Method!**

Walk away from tree and hold the pencil vertically until it is even with the whole tree.

Turn pencil horizontally keeping the end of the pencil at the base of the tree



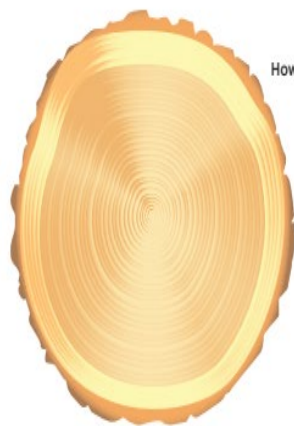


## Aktivnosti

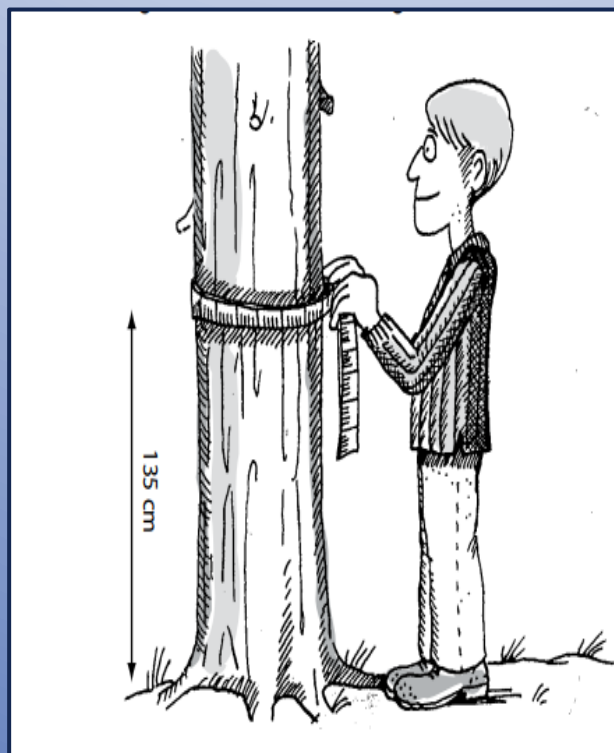
- mjerenje opsega stabala različitim metodama
- prepoznavanje različitih vrsta drveća (listopadne, vazdazelene)
- izračunavanje i određivanje starosti drveta – usporedba starosti
- usporedba opsega različitih stabala
- razumijevanje povezanosti rasta drveta sa stanjem u okolišu

### Resources

Range of tree species; cut log/tree stump (optional); tape measure/string; tree identification keys; magnifying glass (optional).



How many rings?



### Explore

Use ID sheets, books or apps to identify the tree being measured.

Once learners know the species of tree you are measuring, you can make this work more accurately, as different types of tree grow at different speeds.

5. Using the growth rate table below, learners can check the type of tree you have measured and divide the girth by the number given. For example, a sycamore with a girth of 110cm is about 40 years old ( $110 \div 2.75 = 40$ ).

Species of tree	Growth of girth per year (cm)
Average	2.5
Oak and beech	1.88
Pine and spruce	3.13
Sycamore	2.75

Whether a tree is in woodland or in the open, also makes a difference to growth.

### Explore

As a group discuss why this is? Will woodland trees grow faster or slower than trees in the open?

Trees in the open grow faster because there is less competition from other trees, for light, water and nutrients.

6. Learners can build this into their calculations. For example, an average woodland tree increases in girth by approximately 1.25cm per year.

### Explore

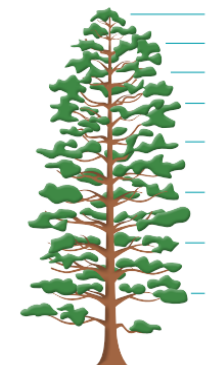
As a group identify whether there are any conifer trees present?

Conifers (pines, spruces, larch, firs) usually grow a whorl of branches each year. If you count the number of whorls of branches up the trunk, you get an approximate age. This is easiest with young trees – up to about 20 years old.

7. Learners can estimate the age of any conifers present using this method. Compare it to the method using girth measurement using the data in the table below. How similar are your results?

### Extension

Learners can draw a timeline for your tree in chalk in the playground and research and mark on this significant moments or events in recent history that this tree would have lived through.



Whorls – this tree is 16 years old



# THE GLOBE PROGRAM

A Worldwide Science and Education Program



Drveće možemo pronaći svuda u okolišu. Iz dječje perspektive, drvo može biti veliko i malo.

Drvo se može dodirivati i mirisati, možemo ga doživjeti svim osjetilima. Na taj način svako drvo pruža izvanredni izvor za učenje prirodoslovnih i matematičkih vještina.



### Foundation Phase and KS2: Measuring tree height

## Estimating the height of a tree

Compare the height of a tree by eye, with objects of a similar height to provide a sense of scale.

#### Skills

Estimation, number processes, fractions, measurement, data & analysis.

#### Resources

Tree(s); measuring tape; chunky chalk.



#### ACTIVITY

##### Explore

How tall is the tree compared to e.g. a person or a nearby building?

This can lead to discussions about closer objects looking bigger while those that are far away seem smaller.

##### Explore

What do you need to do to make your estimate better?

1. Working in pairs the height of a tree can be estimated by measuring one learner.
2. Once measured, this learner stands beside the selected tree.
3. Their partner imagines how many times the measured learner fits (head to foot) into the height of the tree - from the ground to the top of the tree.
4. The pair then multiply the number of times the learner fits, say 4 times, by the height of the learner, say 1 metre, to estimate the height of the tree.



How many times does the person fit into the tree height?

5. As a group discuss how the tree height can be measured this way using the language of fractions.

#### Extension

In pairs, learners draw the length of the tree in chalk on a hard surface playground, and then draw around the shape of your learner who was measured lying lengthways at the base of the 'trunk' of the chalk tree.

Learners then draw the tree's shape to make it look like the one that was measured.

Lastly learners mark in chalk how many times the measured learner's body fitted into the tree.



In this example the tree is 4m tall

Promatranje i praćenje stabla omogućuje učenje na otvorenom, u stvarnom životu. Uz aktivnosti procjene, mjerenja i opažanja djeca razvijaju i socijalne vještine (komunikacija i kreativnost)





## Foundation Phase: Measuring tree girth

### Hugging a tree

Use arm lengths or hand spans to measure the circumference of a tree.

#### Skills

Estimation, measurement, data & analysis.

#### Resources

Tree(s); enough children to encircle a tree;  
Extension: paper/pens/cloth/clay.



#### ACTIVITY

1. Working in a group, ask the learners to choose a tree they like.

#### Explore

Ask the group - How can we work out how big it is all the way round (the tree's girth)?

2. Help the group decide how many people are needed to measure the tree's girth using outstretched arms, touching one another's fingertips, standing around the tree.

3. Experiment with different measures, like hand spans, around the tree.

4. Discuss and decide how to get consistency in measurements between different trees.

#### Explore

Ask the learners to describe the shape and girth of the chosen tree to someone else?

Choosing a site with a variety of trees will enable the group to discuss how the girths of different trees vary, and to choose the appropriate form of measurement whether it is arm lengths or hand spans (or something else!).



How many people?

#### Extension

Learners can make handprints on paper or cloth to show how many hand spans each tree required - hang these from your tree or make a picture washing line outdoors!

Learners can make up a name for the tree from the words used to describe it. Use ID sheets, books or apps to find out the real name of the tree? Try writing the name on a rolled-out piece of clay or mud and stick it on your tree.





**THE GLOBE PROGRAM**

A Worldwide Science and Education Program

# Atmosfera





# THE GLOBE PROGRAM

A Worldwide Science and Education Program

**Weather Adds Up to Climate Student Activity Sheet 5**

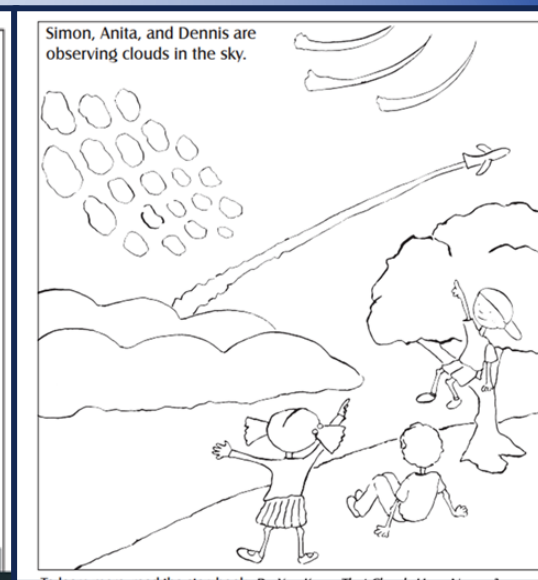
Name(s) \_\_\_\_\_

This is why I'd bring each item...

Write who you would bring each item to one or both of the places.

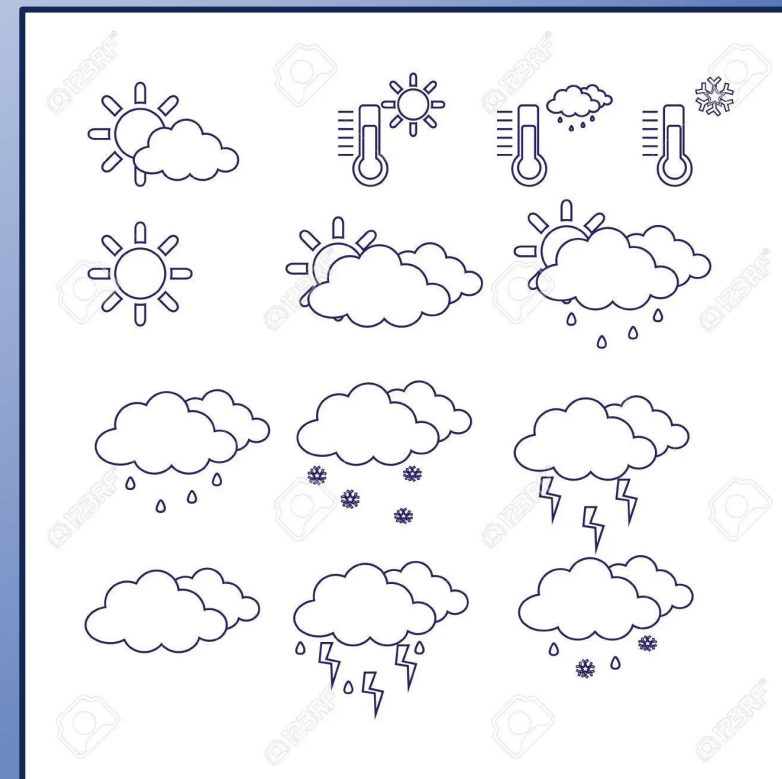
swimsuit	camera
mittens	wood hat
sun hat	journal
sunscreen	swimsuit
coat	life jacket
water bottle	sunglasses
sandals	scarf

**A drawing of my sky:**



## Aktivnosti

- opažanje vremenskih prilika
- opažanje i prepoznavanje boje neba
- upoznavanje s termometrom i načinom mjerenja temperature zraka
- crtanje neba i oblaka
- uspoređivanje vremenskih prilika i izgleda neba tijekom godišnjih doba

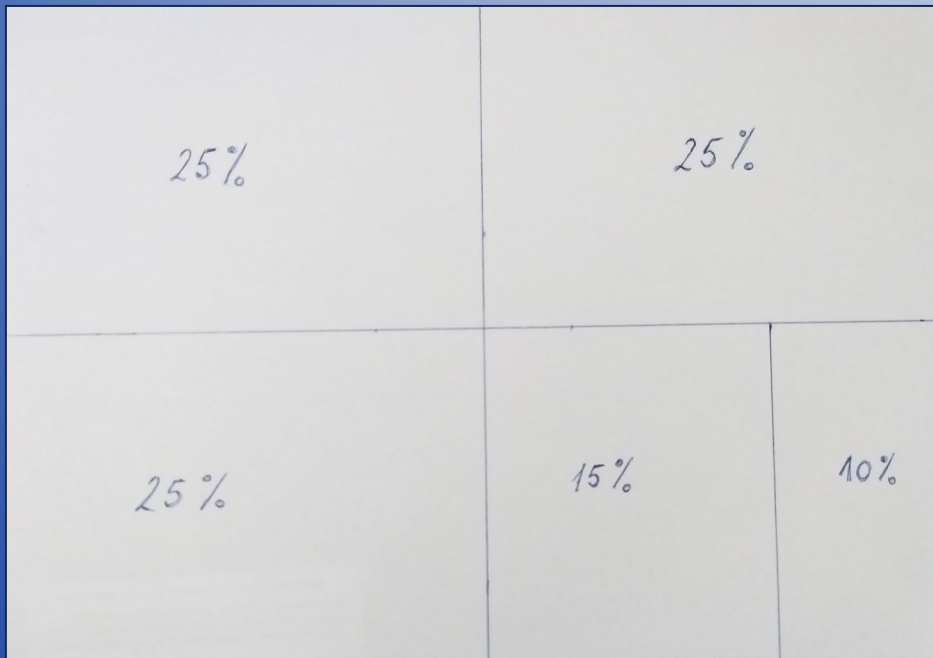


# NAOBLAKA



## Aktivnosti

- procjena količine naoblake na nebu
- izrada modela za vježbanje određivanja količine naoblake







# THE GLOBE PROGRAM

A Worldwide Science and Education Program

## Aktivnosti

- mjerenje temperature zraka termometrom
- mjerenje količine oborine kišomjerom
- opažanje boje neba i vidljivosti, vremenskih prilika
- pisanje dnevnog izvještaja o nebu



Okreni se od Sunca i potraži najtamniju plavu boju na nebu!

Ime \_\_\_\_\_  
Datum \_\_\_\_\_ Vrijeme \_\_\_\_\_  
Lokacija \_\_\_\_\_

Ima li oblaka?

- Nema oblaka  
 Ima malo  
 Ima mnogo  
 Magla je

Ima li oborina?

- Nema  
 Kiša  
 Susnježica  
 Snijeg

Ima li vjetra?

- Povjetarac  
 Snažan vjetar  
 Nema

Napomena: Ako je mnogo oblaka na nebu, nije dobar dan za promatranje boje neba! Pokušaj sutrad!

Temperatura zraka: \_\_\_\_\_ °C

Boja neba: \_\_\_\_\_

Kiša (da/ ne): \_\_\_\_\_

Tlo (suho/mokro): \_\_\_\_\_

Drveće ima lišća (da/ne): \_\_\_\_\_

National Aeronautics and Space Administration

**Sky Color: What's the deepest shade of blue?**

Look Up 45°

Deep Blue Blue Light Blue Pale Blue Milky

**You Can Help NASA Study Aerosols**

Aerosols are very small particles floating in the sky. Although they occur in nature (like pollen), aerosols can also be human-made (like car exhaust). A milky or hazy sky is a sign that there are many aerosols in the sky.

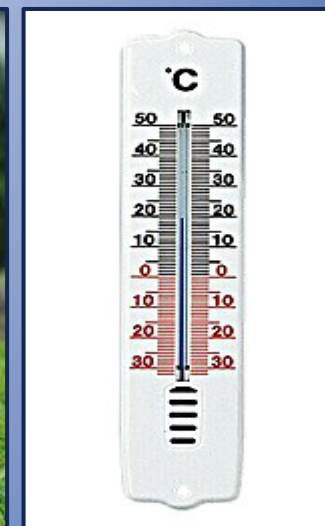
Submit your data through:  
**THE GLOBE PROGRAM**  
or through the GLOBE Observer app, available for Apple or Android devices.

Participate in NASA Science:  
Download the GLOBE Observer app and contribute your observations.  
observer.globe.gov

**Sky Visibility: What does a distant object along the horizon look like?**

Look Across

Unusually Clear Clear Somewhat Hazy Very Hazy Extremely Hazy



Icons for weather conditions: sunny, partly cloudy, cloudy, foggy, windy, raining, snowing.

Celsius temperature labels:

- very cold: less than 0° C
- cold: 0 to 10° C
- mild: 11 to 20° C
- warm: 21 to 30° C
- hot: more than 30° C



## Aktivnosti

- mjerenje i opažanje vremenskih prilika tijekom duljeg razdoblja
- pisanje dnevnog izvještaja
- uspoređivanje promjena temperatura tijekom izmjene godišnjih doba

**Weather Adds Up to Climate Student Activity Sheet 2**

Month \_\_\_\_\_ Name \_\_\_\_\_

number of days

31					
30					
29					
28					
27					
26					
25					
24					
23					
22					
21					
20					
19					
18					
17					
16					
15					
14					
13					
12					
11					
10					
9					
8					
7					
6					
5					
4					
3					
2					
1					

Temperature Conversion Chart

30°C ..... 86°F

20°C ..... 68°F

10°C ..... 50°F

0°C ..... 32°F

very cold less than 0°C	cold 0 to 10°C	mild 10 to 20°C	warm 20 to 30°C	hot more than 30°C
----------------------------	-------------------	--------------------	--------------------	-----------------------

**Weather Adds Up to Climate Student Activity Sheet 1**

Month \_\_\_\_\_ Name \_\_\_\_\_

number of days

31						
30						
29						
28						
27						
26						
25						
24						
23						
22						
21						
20						
19						
18						
17						
16						
15						
14						
13						
12						
11						
10						
9						
8						
7						
6						
5						
4						
3						
2						
1						

sunny	partly cloudy	cloudy	foggy	windy	raining	snowing
-------	---------------	--------	-------	-------	---------	---------

© 2016 University Corporation for Atmospheric Research All Rights Reserved

**Sky Observers Daytime Sky Report**

Face away from the Sun and look for the deepest color of blue.

Name \_\_\_\_\_ Date \_\_\_\_\_

Time \_\_\_\_: \_\_\_\_ AM or PM (circle one)

Location \_\_\_\_\_

<b>Are there clouds?</b>	<b>Is there precipitation?</b>	<b>Is there wind?</b>
<input type="checkbox"/> no clouds	<input type="checkbox"/> none	<input type="checkbox"/> gentle wind
<input type="checkbox"/> some clouds	<input type="checkbox"/> rain	<input type="checkbox"/> strong wind
<input type="checkbox"/> lots of clouds	<input type="checkbox"/> sleet	<input type="checkbox"/> no wind
<input type="checkbox"/> fog	<input type="checkbox"/> snow	

Note: If there are lots of clouds, then this is not a good day to make a sky color report. Try again tomorrow!

**A drawing of my sky:**

**The deepest color I see:**

deep blue

blue

light blue

pale blue

milky

other \_\_\_\_\_

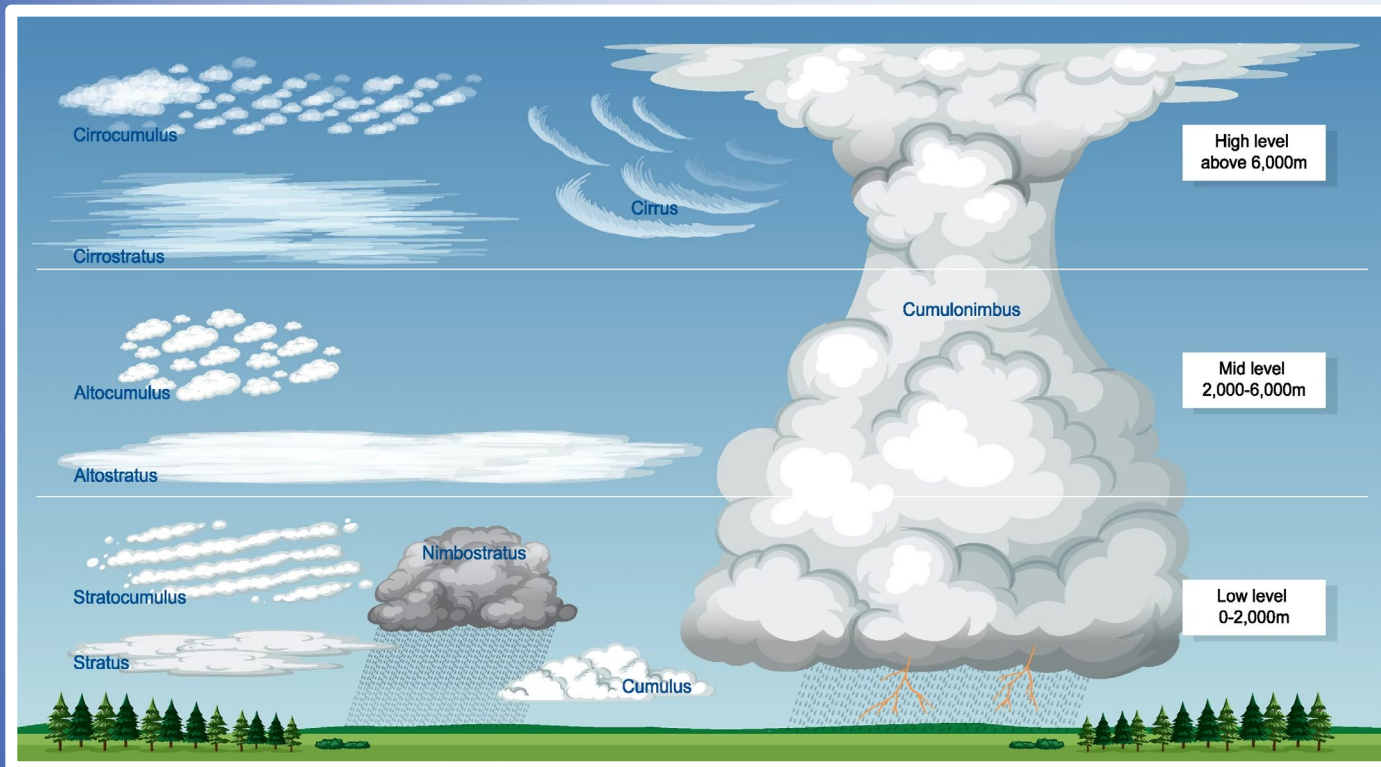
**Visibility:**

very clear

clear

somewhat hazy

very hazy



## Aktivnosti

- prepoznavanje vrsta oblaka
- crtanje oblaka
- izrada modela oblaka
- povezivanje vrsta oblaka s vremenskim prilikama

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Name the Clouds



Puffy clouds that look like pieces of floating cotton



White, delicate, and feathery clouds found at high altitudes



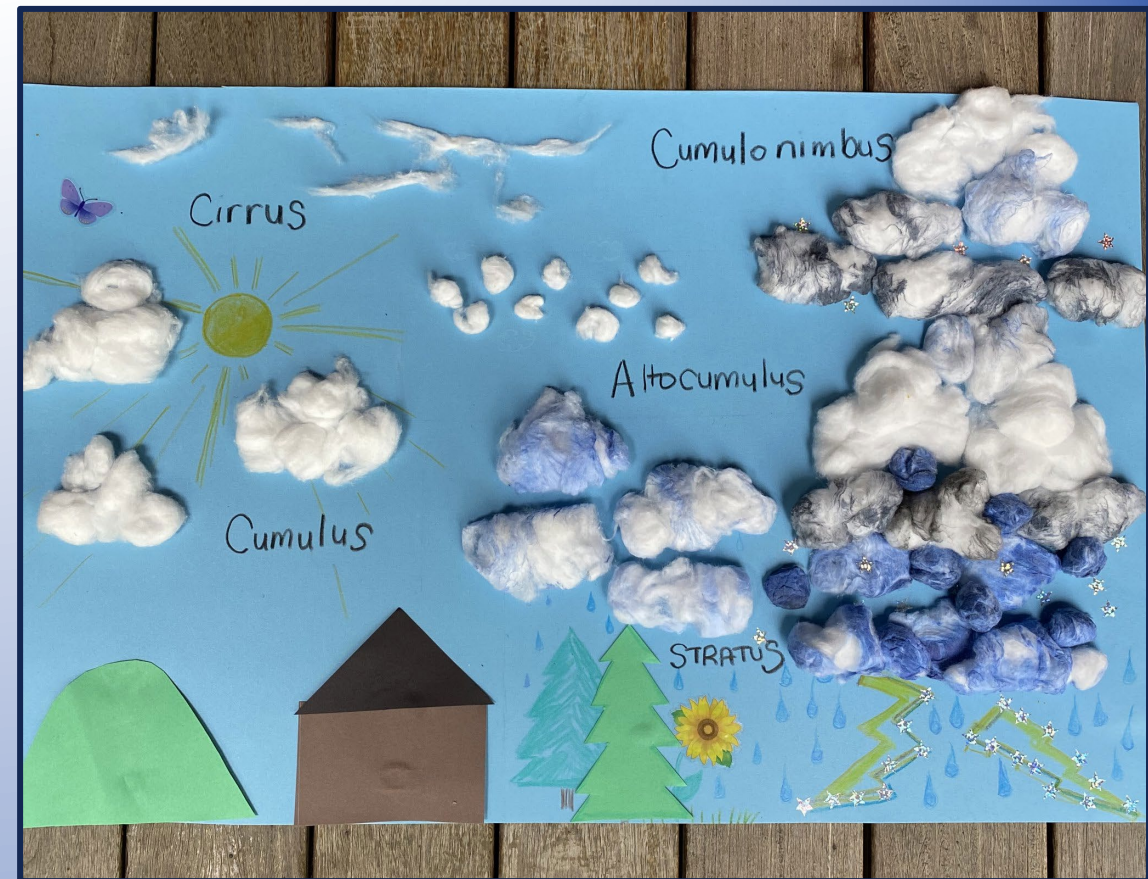
Low, puffy, whitish, or grayish clouds that occur in patches



Low-level clouds that are blanket-like with a uniform grey or white color



Low-level thunderstorm clouds

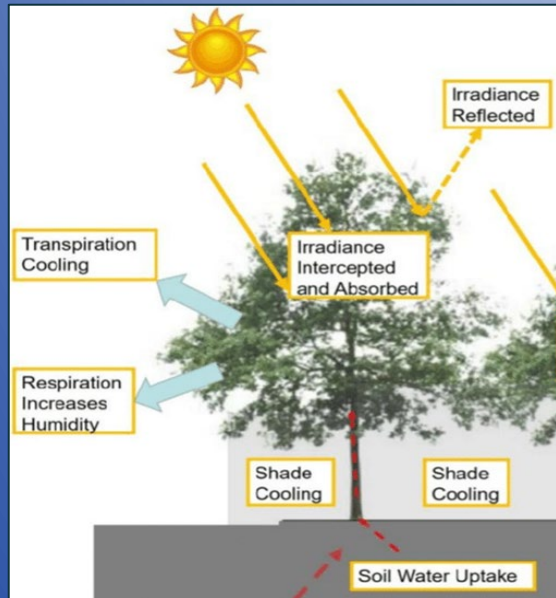


Izrada modela, plakata  
i pokusa



## Aktivnosti

- mjerenje površinske temperature tla
- razumijevanje da je Sunce glavni izvor energije za Zemlju
- uspoređivanje površinskih temperatura na različitim površinama
- razumijevanje da čovjek svojim djelovanjem može utjecati na okoliš
- opisati kako nas drvo štiti od sunčevog zračenja



# THE GLOBE PROGRAM

A Worldwide Science and Education Program

## Elementary GLOBE All About Earth: Our World on Stage Earth System in a Bottle Student Activity Sheet

Name \_\_\_\_\_

Date: \_\_\_\_\_

Draw what you see in this terrarium.

This terrarium included:

- Light
- Soil
- Water
- Seeds/plants
- Air



Write about what you see in this terrarium.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## Elementary GLOBE All About Earth: Our World on Stage Earth System in a Bottle Recipe Card

### Earth System in a Bottle Recipe

Each group will make two terrariums. All groups will make a terrarium that has all of the parts of the Earth's systems. Then each group will make a second terrarium that is missing one part of the Earth's systems.

#### Earth System in a Bottle

- Step 1**  
Add soil  
1. Put about **three cups of soil** in the bottom section of the terrarium and pat the soil gently until it is fairly firm.
- Step 2**  
Add water  
2. Add about a **quarter cup of water** and look at the soil from the side to make sure that all of the soil gets wet. If there's still dry soil, add more water.
- Step 3**  
Plant seeds  
3. Drop **4-5 radish seeds** onto the surface of the soil. Use your fingertip to push the seeds just below the soil surface. Sprinkle a little more soil on top of the seeds just to cover them.
- Step 4**  
Terrarium  
4. Place the top section of the terrarium on top, pushing alternate flaps to the inside and outside so that it fits securely. Make sure the lip/top is still on the bottle.

#### Experiments

Student groups: check with your teacher to decide which of the three experiments below you are doing.

- No light!**  
To darken the terrarium, wrap it with a **sheet of foil** large enough to go around the bottle twice. Crimp the foil securely shut over the top and bottom of the bottle.
- No soil**  
Instead of soil, place a thoroughly **moistened paper towel** in the bottle, folded to fit into the bottom section.
- No water**  
Follow the planting directions above: except **omit the water**. Be sure to use previously dried soil.

## Elementary GLOBE All About Earth: Our World on Stage We're All Connected Chart Template 1

Name \_\_\_\_\_ Date \_\_\_\_\_

Today I saw \_\_\_\_\_

Circle the part where it belongs.  
Draw arrows to describe how to connect it to other parts.

Water

Soil and Rocks

Sun

Air

Living Things

© 2001 Latham Corporation for Atmospheric Research. All Rights Reserved.

## All Year Long Student Activity Sheet 2

Name \_\_\_\_\_

Date \_\_\_\_\_

Weather \_\_\_\_\_

Temperature  Hot  Warm  Cool  Cold

### Big Picture View

Write or draw your observations here.

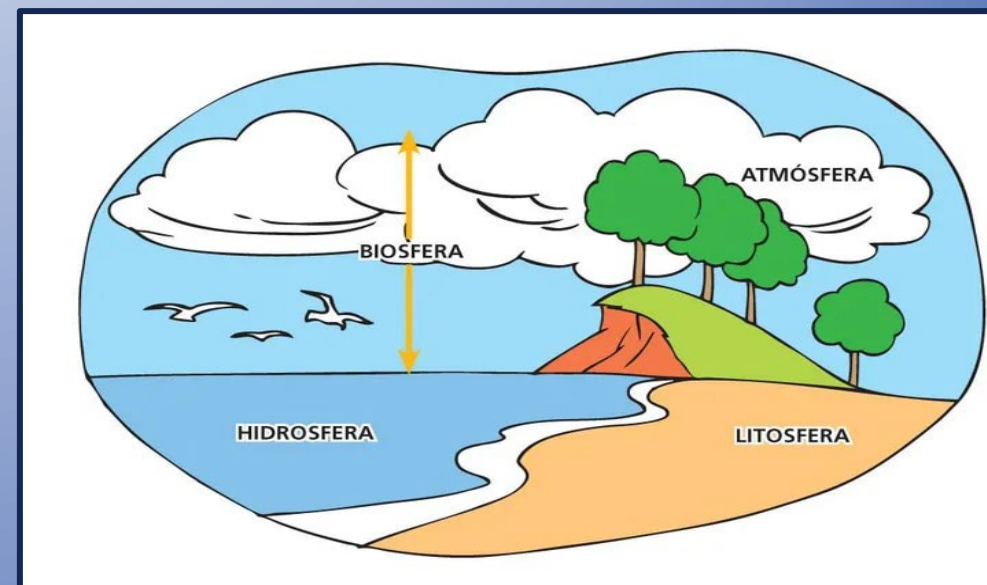
## Aktivnosti

- povezivanje boja u prirodi sa sezonskim promjenama u okolišu
- opažanje i crtanje okoliša
- praćenje promjena u prirodi
- pisanje izvještaja o stanju u okolišu
- razvijanje prirodoslovnog mišljenja – donošenje zaključaka temeljem promatranja i mjerenja
- uočavanje povezanosti živih bića s neživom prirodom



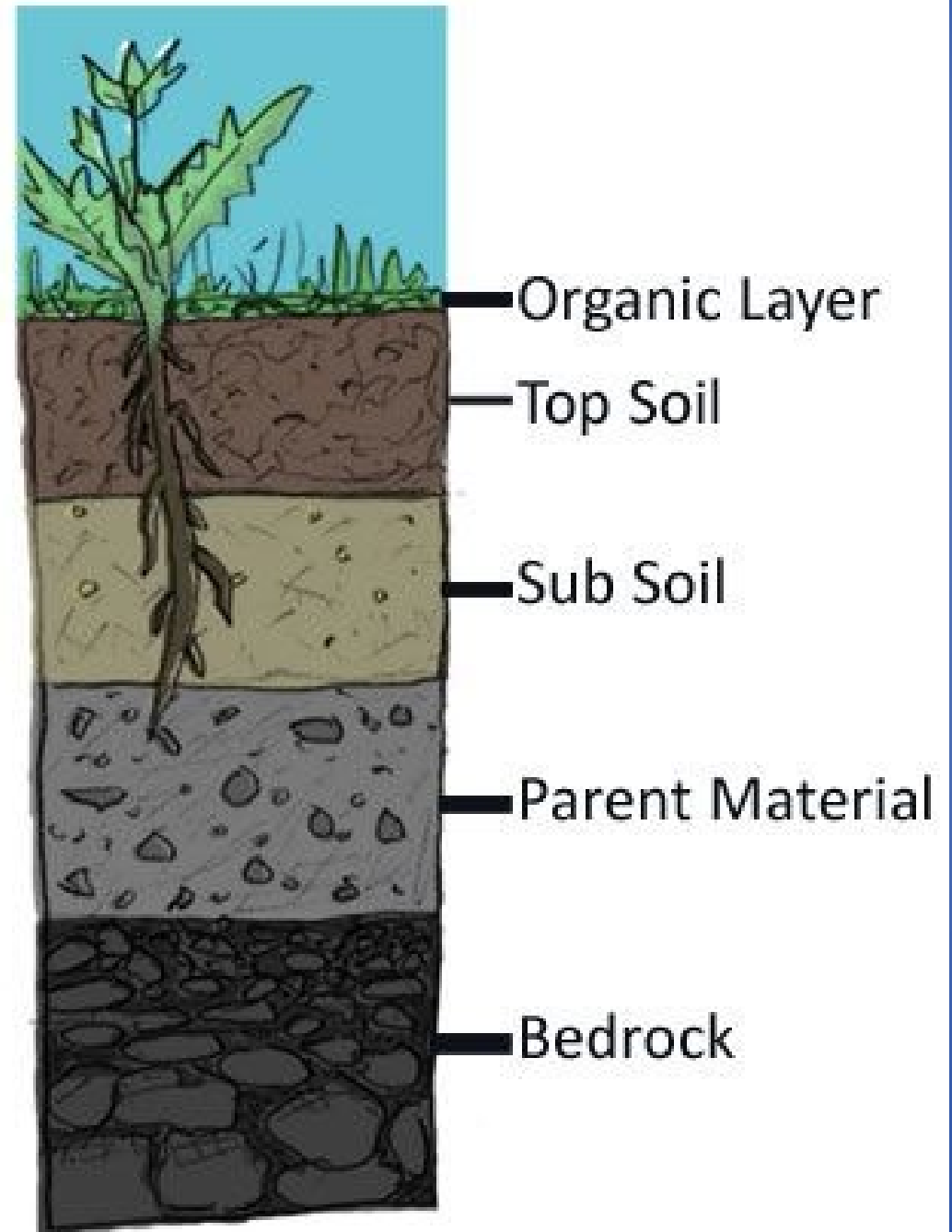
## Aktivnosti

- razvijanje kreativnog mišljenja
- STEAM
- prezentiranje stečenog znanja izvođenjem i osmišljavanjem igrokaza





# TLO



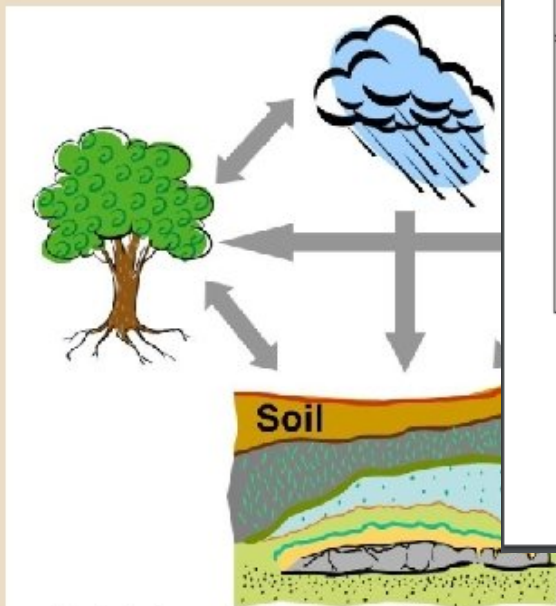


## Aktivnost:

-upoznavanje nastanka tla

## Soil Forming Factors

- Parent Material
- Climate
- Organisms
- Relief
- Time



<http://cals.arizona.edu/watershedsteward/resources/module/Soil/soil-s-intro-pg3.htm#>

## Layers of Soil

Anita, Simon, and Dennis are studying soil in a hole that Scoop dug. Can you find Scoop in this picture?



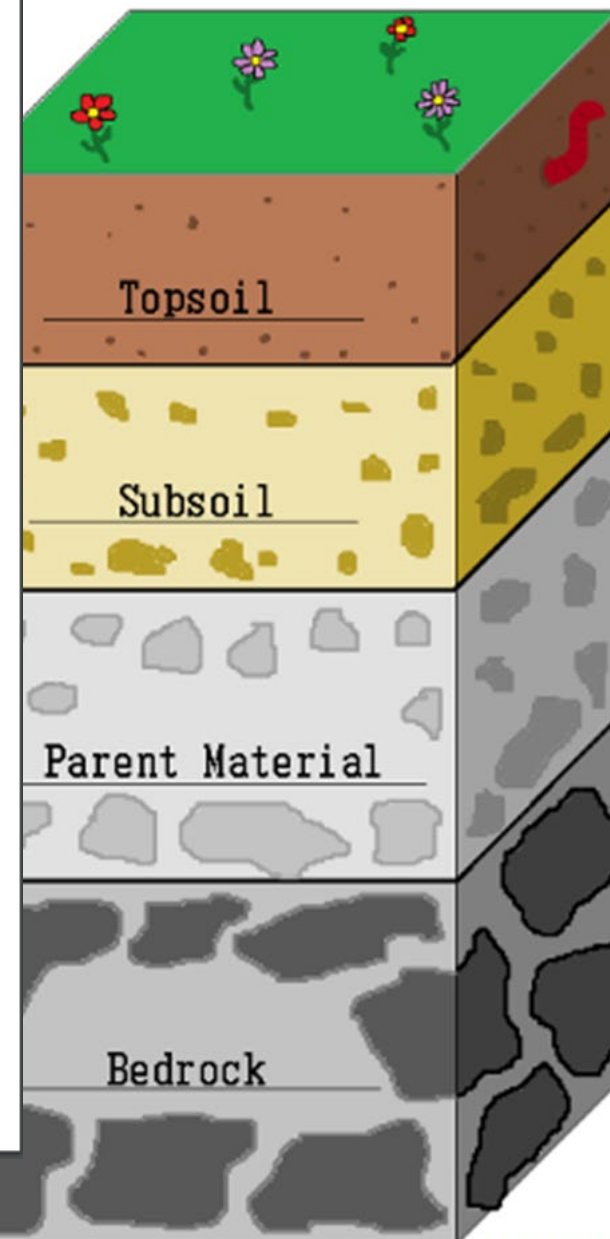
To learn about the soils that Scoop dug, read the storybook, *The Scoop on Soils*.

Download it for free at the Elementary GLOBE website.

[www.globe.gov/elementaryglobe](http://www.globe.gov/elementaryglobe)



Elementary GLOBE is developed at UCAR with support from NASA.

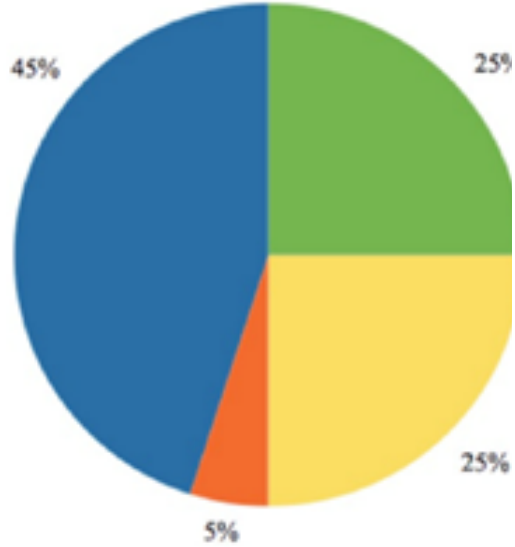


Soil profile

**Aktivnost:**

-upoznavanje sastava

**IDEALAN SAS**



Approximate Total Soil

Elementary **GLOBE** The Scoop on Soils  
**Soil Treasure Hunt Student Activity Sheet 1**

Name \_\_\_\_\_ Date \_\_\_\_\_

**My Soil Investigation!**

My prediction or question about the soil is:

These are the things I found in the soil:

Elementary **GLOBE** The Scoop on Soils  
**Soil Treasure Hunt Student Activity Sheet 2**

Name \_\_\_\_\_ Date \_\_\_\_\_

**Outdoor Soil Investigation!**

This is where I studied soil outside:

Soil Color

(Rub a little soil above to show color.)

These are the things I found in the soil:

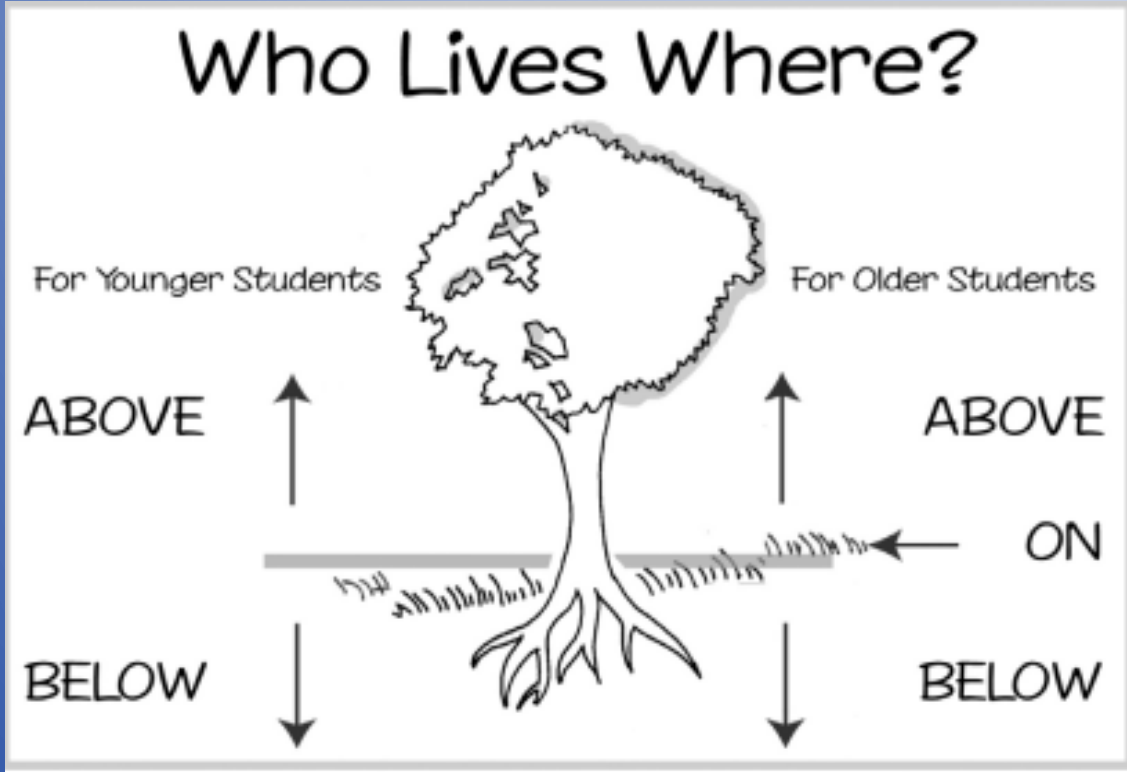
Ima važnu

**Aktivnost:**

- igranje igre: Tko živi na tlu i u tlu ?
- Svi trebamo tlo

- Rabbit + Dig + Soil = Burrow (Home)
- Worm + Dig + Soil = Tunnels (Home)
- Mole + Dig + Soil = Burrow (Home)
- Seeds + Plant + Soil = Plants (Food)
- Ants + Dig + Soil = Ant Colony (Home)
- Prairie Dog + Dig + Soil = Burrow (Home)
- Termites + Dig + Soil = Termite Nest (Home)
- Chipmunk + Dig + Soil = Burrow (Home)

- GROUP 3 + GROUP 2 + GROUP 1 + SOIL =FOOD/HOME
- Human + Plant + Corn Kernels + Soil = Corn Crop (Food)  
"A human takes corn kernels and plants them in soil to grow corn for food."
- Human + Mix + Water + Soil (Clay) =Bricks for House (Home)  
"A human mixes water and clay (soil) to make bricks to use when building a home."



Name \_\_\_\_\_ Date \_\_\_\_\_

Draw the parts of the soil connection in the boxes.

	+		+		=	
Item from Group 1 (Plants and Animals)		Item from Group 2 (Actions)		Soil		Type of Home/Food

Write your soil connection in a sentence.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Elementary GLOBE

We All Need Soil! Student Activity Sheet

The Scoop on Soils



# THE GLOBE PROGRAM

A Worldwide Science and Education Program

## We All Need Soil! Activity Cards Sheet 2

Group 1 Cards

Rabbit	Corn
Worm	Prairie Dog
Chipmunk	Ants
Seeds	Mole
Termites	Water

## We All Need Soil! Activity Cards Sheet 3

Group 2 Cards

Plant	Plant
Mix	Mix
Dig	Dig
Dig	Dig
Dig	Dig

## We All Need Soil! Activity Cards Sheet 4

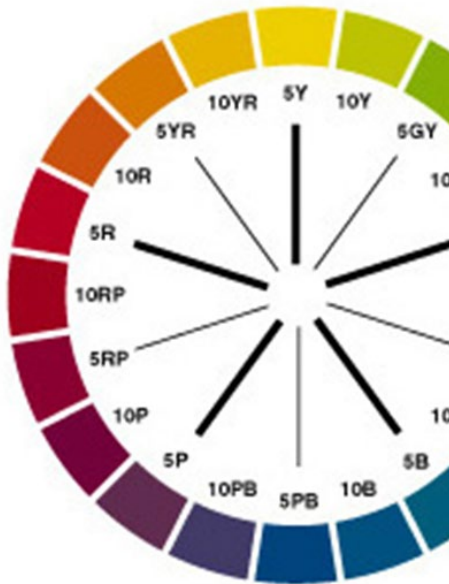
Home/Food Cards

Tunnel	Bricks
Burrow	Burrow
Burrow	Burrow
Termites' Nest	Ant Colony
Garden	Plants

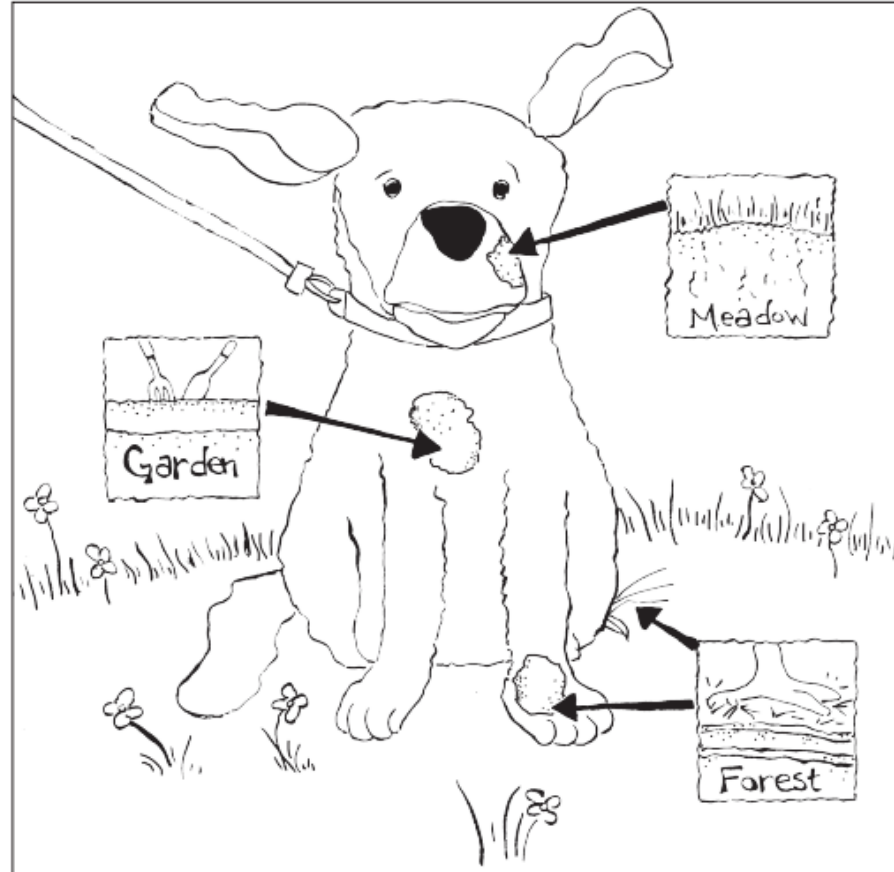
**Aktivnost:**

- upoznavanje svojstava tla
- crtanje bojom dobivenih uzoraka tla

**MUNSELOVA LJESTVICA**



Scoop is covered in soil! He's been digging holes in three places. Soils from different places can be different colors.



To learn about the soils that Scoop digs, read the storybook, *The Scoop on Soils*.

Download it for free at the Elementary GLOBE website.  
[www.globe.gov/elementaryglobe](http://www.globe.gov/elementaryglobe)



Elementary GLOBE is developed at UCAR with support from NASA.



**World Soil Day Drawing Competition**



All Island Drawing Competition for School Students to Celebrate the World Soil Day on 5<sup>th</sup> December Organized by the Soil Science Society of Sri Lanka

**Theme of the drawing competition:** Protect Soils: Where Food Begins

**Who can participate?**

School students in all government and private schools in Sri Lanka

**Competition Categories**

- A. Primary School Students (age 5 - 10)
- B. Secondary School Students (age 11 - 14)

**Type of Drawing:** Pastel, Watercolor or any other color paintings

**Paper size:** A4, A3 or 18" x 14"

**Prizes and Awards**

- Certificates and valuable cash prizes will be awarded for winners in a ceremony held at the SRICANSOL Centre, Faculty of Agriculture, University of Peradeniya.

**Deadline:** 25<sup>th</sup> November 2022

**How to submit?**

Step 1: Send the scan copy of your drawing and your information through the link below:  
[https://docs.google.com/forms/d/17KmsH\\_Pkdc8w01-hqMjd2yw5w2TmHTK0OGU95bc4/edit](https://docs.google.com/forms/d/17KmsH_Pkdc8w01-hqMjd2yw5w2TmHTK0OGU95bc4/edit)

Step 2: Send the original paper drawing through registered post to: Prof. W.A.U. Vitharana, President Soil Science Society of Sri Lanka, SRICANSOL Center, Department of Soil Science, Faculty of Agriculture, University of Peradeniya, Peradeniya 20400, Sri Lanka

For more information and guidelines visit web: <https://sssol.org>

Contact the organizing committee: 0719367648



Soil Science Society of Sri Lanka  
[www.sssol.org](http://www.sssol.org) | [soilsci@sssol.org](mailto:soilsci@sssol.org)  
[www.facebook.com/sssol.soc](https://www.facebook.com/sssol.soc)

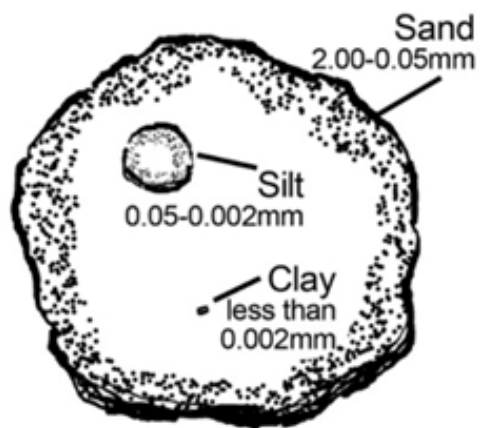


<https://rb.gy/e3pb56>



## Aktivnost:

-upoznavanje svojstava tla: tekstura



Particle Size Comparison



Elementary GLOBE The Scoop on Soils  
Getting To Know Soil Student Activity Sheet 2

Name \_\_\_\_\_ Date \_\_\_\_\_

The soil in the jar looked like this after:

2 minutes      10 minutes      24 hours (1 day)

© 2011 Lifestream Corporation for Atmosphere Research. All Rights Reserved.

Elementary GLOBE The Scoop on Soils  
Getting To Know Soil Student Activity Sheet 3

Directions: Name \_\_\_\_\_

1. Cut along the dotted lines.
2. Color the layers on the bottle with pictures the colors you see in your bottle.
3. Fill in the missing letters on the bottle with words.
4. Put the bottle with words on top of the bottle with pictures and staple them together on one side at the black marks.

water  
\_rganic  
\_ \_ ay  
\_ilt  
\_and

© 2011 Lifestream Corporation for Atmosphere Research. All Rights Reserved.

	VELIČINA MINERALNE ČESTICE	OSJEĆAJ POD PRSTIMA
PIJESAK	0.05 mm do 2 mm	pjeskovit, zrnat
PRAH	0.05 mm do 0.002 mm	brašnast i gladak
GLINA	manje od 0.002 mm	ljepljiv i gust



## Aktivnost:

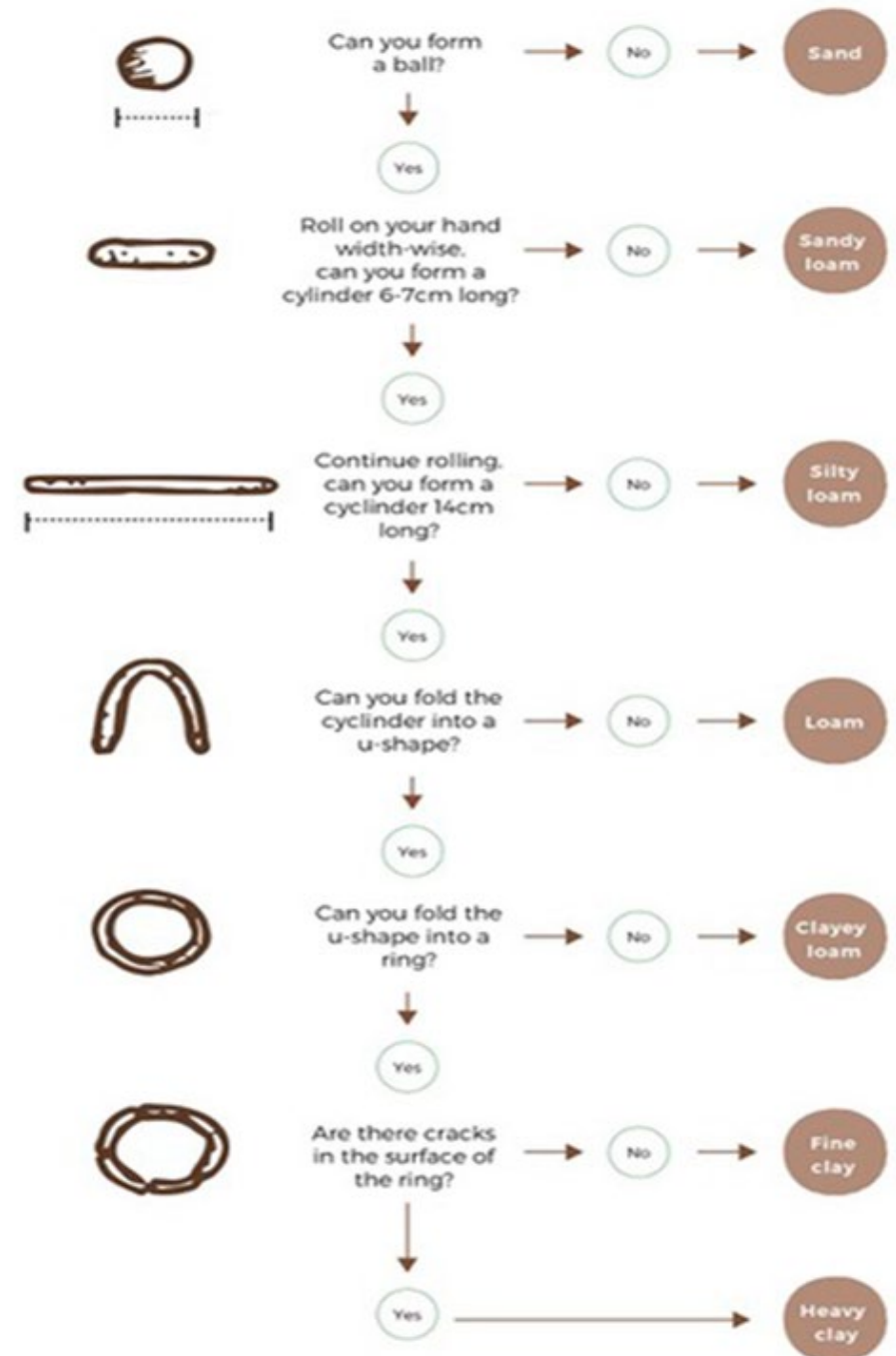
-procjena  
teksture tla na  
temelju  
oblikovanja  
prstima

	<b>pijesak (sand)</b>	<b>ilovasti pijesak (loamy sand)</b>	<b>ilovača (loam)</b>	<b>glinena ilovača (clay loam)</b>	<b>glina clay</b>
<b>OBLIKOVANJE GRUMENA VELIČINE JAJETA I VRPCE</b>	Od vlažnog uzorka se ne može oblikovati grumen.	Od vlažnog uzorka se oblikuje grumen i stiskanjem između palca i kažiprsta se oblikuje mala vrpca.	Od vlažnog uzorka se oblikuje grumen i stiskanjem između palca i kažiprsta se oblikuje vrpca manja od 2cm.	Od vlažnog uzorka se oblikuje grumen i stiskanjem između palca i kažiprsta se oblikuje vrpca dulja od 2 cm do 5cm.	Od vlažnog uzorka se oblikuje grumen i stiskanjem između palca i kažiprsta se oblikuje vrpca dulja od 5cm.
<b>IZGLED UZORKA, LJEPLJIVOST, OPIP POD PRSTIMA</b>	Sipke čestice.	Staviti na dlan i trljati kažiprstom, javlja se pjeskoviti osjećaj.	Glatko i lagano za stisnuti, slabo ljepljivo.	Slabije ljepljivo i lakše se stisne od gline.	Jako ljepljivo, teško za stisnuti, ostavlja prljave ruke, sjajno uslijed trljanja.

## Aktivnost:

-procjena teksture tla oblikovanjem prstima

	pijesak (sand)	ilovasti pijesak (sandy loam)	ilovača (loam)	glinena ilovača (clay loam)	glina (clay)
<b>IZGLED UZORKA, LJEPLIVOST, OPIP POD PRSTIMA</b>	sipke čestice	pjesko viti osjećaj na dlanu	glatko slabo ljepljivo lagano za stisnuti	slabije ljepljivo i lakše se stisne od gline	jako ljepljivo, teško za stisnuti, ostavlja prljave ruke, sjajno uslijed trljanja







## Aktivnost:

## -pomoću vodiča za tlo analiziraj uzorak tla

Radionica: **Čovječje GLOBE** (Analiza tla)  
Priredila: Anika **Vojnić**, učitelj savjetnik

### VODIČ ZA TLO

#### VODIČ ZA PROCJENU STRUKTURE TLA ( OBLIK ČESTICA)

Staviti uzorak tla na dlan i promatrati.

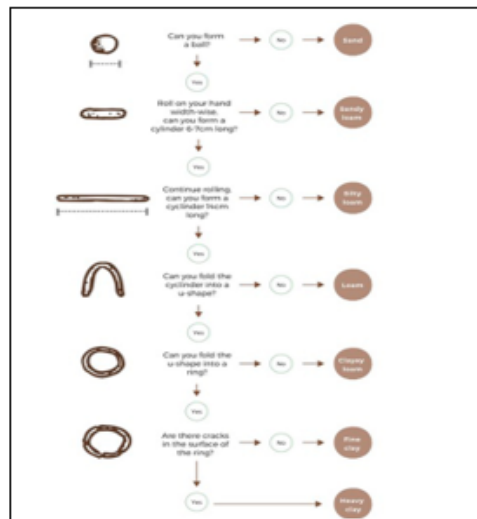
grupača- čestična (GRANULAR)	grupača ili kamenita (BLOCKY)	prizmatična (PRIZMATIC)	stupača (COLUMNAR)	plitka (PLATY)	zrnato (SINGLE GRAINED) Masivno (MASSIVE)
zrna tla nisu veća od 0,5 cm	nepravilne grude veličine 1,5 cm do 5 cm	vertikalni redovi tla; pri dnu profila	vertikalne kolone tla koje imaju bijelu kapu na vrhu; suha tla	tanke ravne ploče koje leže horizontalno	ako je nemoguće odrediti strukturu horizonta

#### VODIČ ZA PROCJENU ČVRSTOĆE TLA

Držati grumen između palca i kažiprsta, nježno stiskati dok se ne raspadne ili ne ispadne iz ruke.

Rahlo, mekano (LOOSE)	Prhko, <b>zrepljivo</b> (FRIABLE)	Čvrsto (FIRM)	Jako čvrsto (EXTREMELY FIRM)
Struktura se raspada	Grumen se lomi s malo snage	Grumen se lomi tek pod jačim pritiskom	Ne može se smrviti rukama nego treba čekić

#### VODIČ ZA PROCJENU TEKSTURE TLA



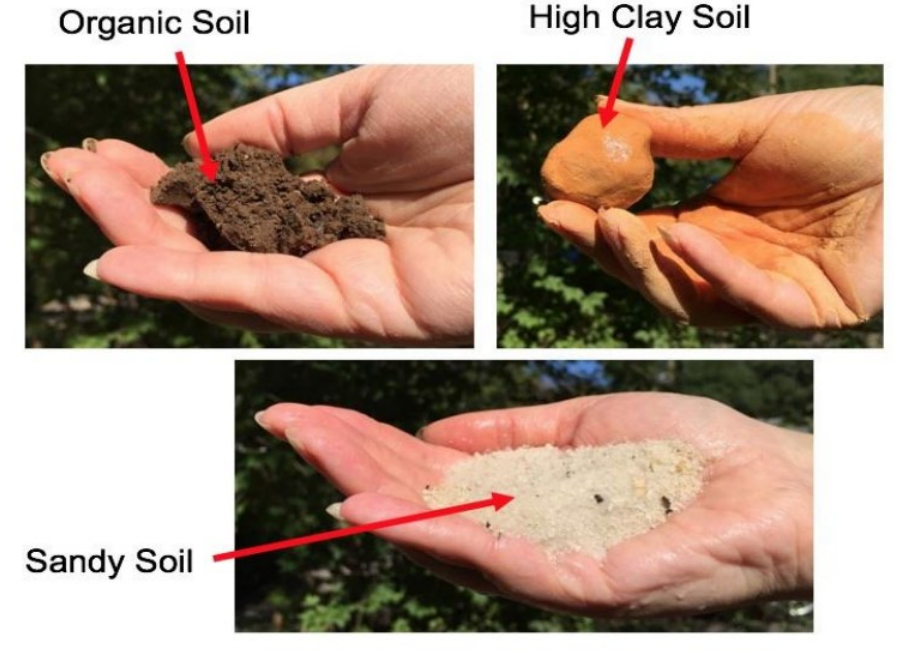
	pjesak (sand)	ilovasti pjesak (sandy loam)	ilovača (loam)	glinena ilovača (clay loam)	glina (clay)
IZGLED UZORKA, LJEPLIVOST, OPIP POD PRSTIMA	sipke čestice	pjeskoviti osjećaj na dlanu	glatko slabo ljepljivo lagano za stisnuti	slabije ljepljivo i lakše se stisne od gline	jako ljepljivo, teško za stisnuti, ostavlja prljave ruke, sjajno usljed trljanja

Radionica: **Čovječje GLOBE** (Analiza tla)  
Priredila: Anika **Vojnić**, učitelj savjetnik

NAPOMENA! Uzorak za analizu treba biti vlažan. Ako je suh, namočite ga destiliranom vodom.	Procjena boje tla	Prisutnost korijenja ništa /malo / puno	Prisutnost stijena ništa /malo / puno	Procjena strukture tla	Procjena čvrstoće tla	Procjena teksture tla (Opip prstima)	Procjena teksture tla (Oblikovanje prstima)
UZORAK: _____							
DATUM: _____							
VRIJEME: _____							
LOKACIJA: _____							

**Aktivnost:**

-razumijevanje kako voda teče kroz različite vrste tla i kako se mijenja prolaskom kroz ta tla



**Water For Plant Use**



**Water Storage**



**Atmospheric Humidity**



**Evaporation**

Models are representations of concepts, objects, or systems, some of which can be excellent teaching tools. A household sponge will be used to demonstrate several characteristics of the relations of soil and water.



**"Dry" Soils**



**Infiltration and Runoff**



**Wetting and Saturation**



**Water Holding Capacity**



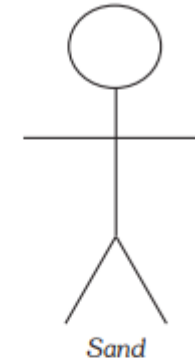
**Percolation and Drainage**



**Engineering and Bearing Capacity**

**Aktivnost:**

- ispitivanje propusnosti različitih vrsta tla
- igranje igre „Biraj stazu”



<https://www.soils4kids.org/files/s4k/perkin.pdf>

**Just Passing Through – Beginners**

Work Sheet

Look and Guess

My soil is \_\_\_\_\_ color



My soil looks granular blocky

My soil has leaves. YES NO



Time \_\_\_\_\_



How much water will come out? Make your line RED.

What will the water look like? (CIRCLE)

Just Passing Through Beginners Work Sheet (continued)



Experiment and Report

Time \_\_\_\_\_



How much water came out?



What did the water look like?

My Report




---



---



---



---

## Aktivnost:

-istraživanje koja je vrsta tla najbolja za uzgoj biljaka



## Pribor i materijal:

četiri prozirne plastične čaše, različite vrste tla ( pijesak, zemlja s vanjskog vrta, glina...), velike sjemenke graha i voda.

## Postupak:

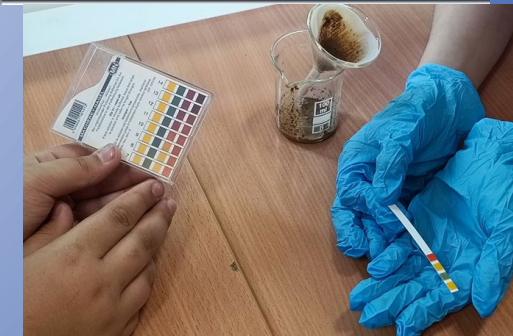
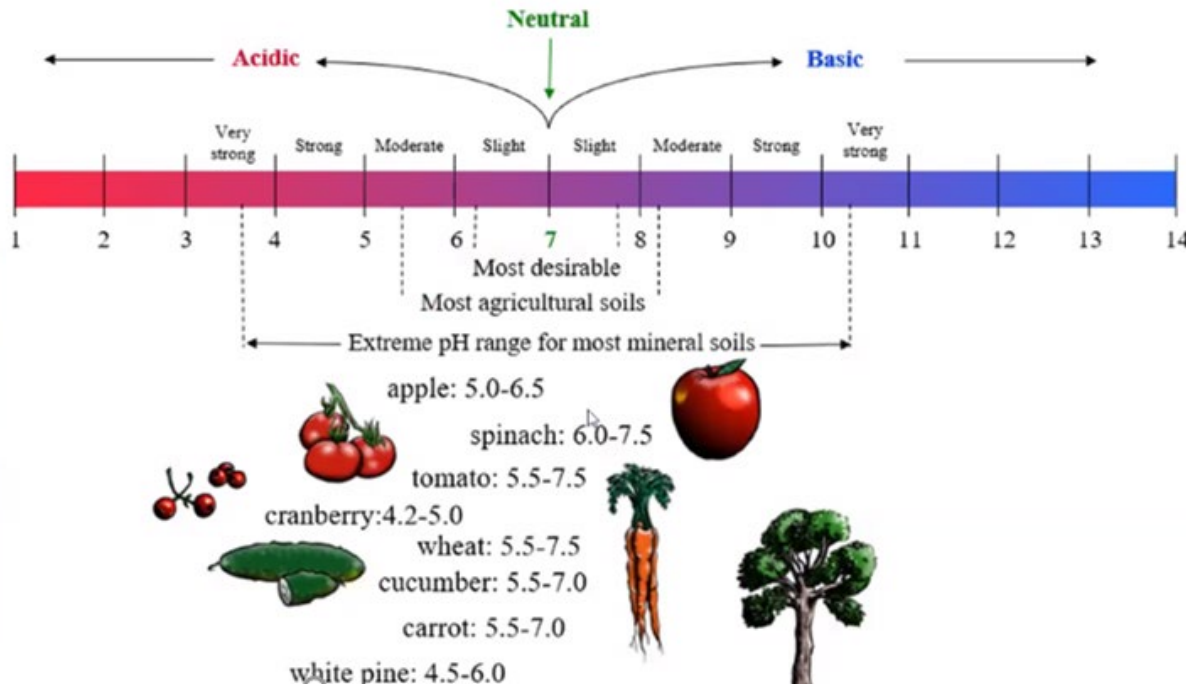
- napuniti čaše do  $\frac{3}{4}$  visine različitim vrstama tla
- posadite 2-3 sjemenke graha u svaku čašicu (više uz rub da bi mogli bolje promatrati rast sjemenke)
- u svaku dodati jednaku izmjerenu količinu vode
- napraviti radni list za bilježenje rezultata
- predviđati ono što misle da će se dogoditi
- crtati i bilježiti opažanja

**Aktivnost:**  
-ispitivanje pH tla



**pH Mjerenja**

Moguć raspon pH vrijednosti u tlima



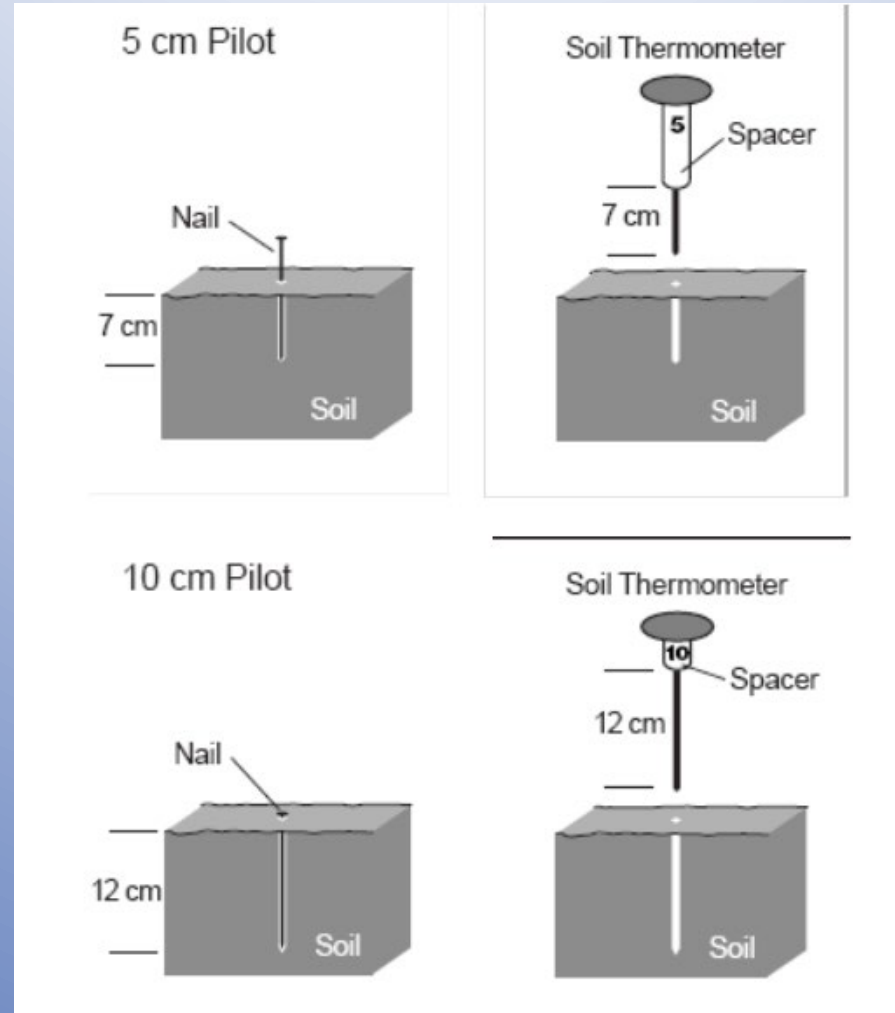
**Postupak:**

- pomiješati istu količinu tla i destilirane vode (omjer 1:1)
- dobro miješati nekoliko minuta
- pustiti da se talog tla slegne na dno čaše
- kratko uroniti trakicu indikatora u bistru otopinu i odrediti pH vrijednost usporedbom sa skalom boja na pakiranju

**Aktivnost:**

-mjerjenje temperature tla  
na 5 cm dubine i 10 cm  
dubine

**Potreban pribor:** ubodni  
termometar, markirani čavao



# VODA

Učestalost mjerenja: jednom tjedno



## Aktivnost:

-opisivanje i crtanje  
vodenog tijela u svom  
okolišu



The GLOBE Kids are on a field trip to Willow Creek. They are excited to make observations of the creek.



To find out what they learn about, read the storybook, *Discoveries at Willow Creek*.

Download it for free at the Elementary GLOBE website.  
[www.globe.gov/elementaryglobe](http://www.globe.gov/elementaryglobe)



## Aktivnost:

-mjerjenje temperature vode

## Postupak:

- termometar uroniti na 10 cm dubine u kantu s vodom
- čekati tri minute i očitati temperaturu
- postupak ponoviti tri puta


VIDEO UPUTA ZA MJERENJE TEMPERATURE VODE

<https://youtu.be/JILxeToZi9Y>





**Reading Thermometers** Name: \_\_\_\_\_ Date: \_\_\_\_\_

Match up each season to the thermometer that shows the most likely temperature for that season.





Spring







Summer






Autumn

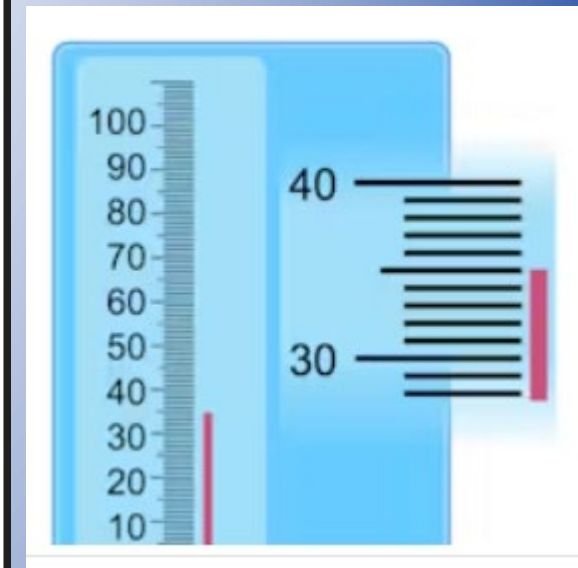




Winter










© Brian Duckworth 2020



**Reading Thermometers** Name: \_\_\_\_\_

Cut out the labels and stick them onto the diagram of the thermometer in the correct position.

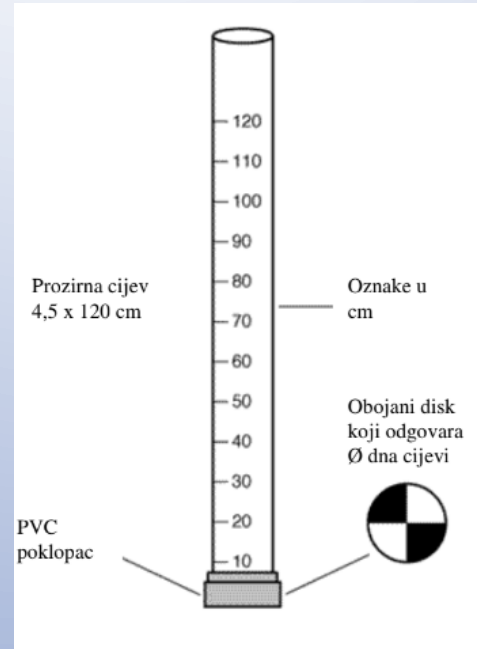


	room temperature 20°C
	fridge 4°C
	water boiling 100°C
	water freezing 0°C
	hot bath 55°C
	body temperature 37°C

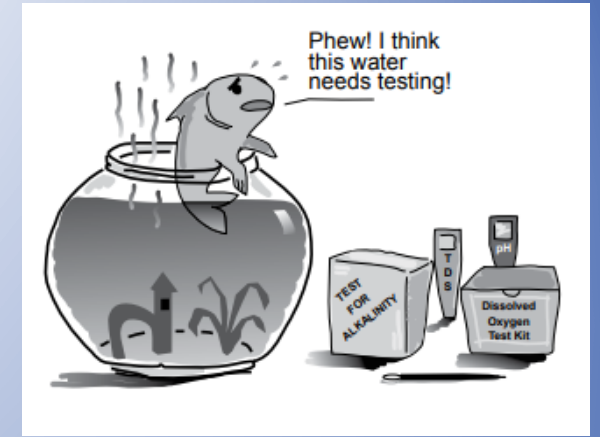
© Brian Duckworth 2020

**Aktivnost:**

- određivanje prozirnosti vode
- istraživanje utjecaja suspendiranih čestica na prozirnost vode



Sample	Student #1	Student #2	Student #3
Water in bucket			
Tube placed in bright light			
Water with soil (2 grams)			
Water with soil (4 grams)			
Water with soil (6 grams)			
Green water (2 drops)			
Green water (6 drops)			







**Aktivnost:**

-mjerjenje pH vrijednosti vode

-igra „Vodeni detektivi”

<https://www.globe.gov/documents/11865/0fffb28b-c06f-4ae6-8375-6abd0ec8a854>



Cup	Look 	Listen 	Smell 	Feel 	pH Test
1 one					
2 two					
3 three					
4 four					

1. Look at the cups. Put an X next to the cups that do not look like water.
2. Listen to the cups. Put an X next to the cups that do not sound like water.
3. Smell the cups. Put an X next to the cups that do not smell like water.
4. Feel water dipped from the cups. Put an X next to the cups that do not feel like water.

Which cup has ONLY water? \_\_\_\_\_



## Aktivnost: -ispitivanje svojstava vode

Radionica: ~~Čovječanstvo~~ GLOBE (hidrologija) 27.11.2023.

Prirredila: Anika ~~Veselić~~ učitelj savjetnik

### VODENI DETEKTIVI

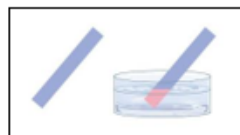
**1. Zadatak:** U dvije čašice nalaze se tajanstvene tvari koje će se sada smatrati zagađivačem vode. **Vaš je zadatak da otkrijete koja tvar se nalazi u kojoj čašici, a u kojoj čašici je samo voda.**

**Potreban pribor i kemikalije:** tri plastične čaše, limunov sok, otopina sode bikarbone, vodovodna voda, destilirana voda

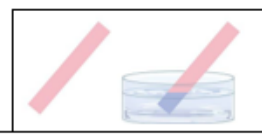
#### UPUTA ZA RAD:

- U čašama se nalaze limunov sok, otopine sode bikarbone i vodovodne vode. Odredi boju uzoraka, miris uzoraka i opip uzoraka.
- U svaki od uzoraka uroni pomoću pincete najprije komadić plavog pa komadić crvenog lakmusovog papira.

Temeljem prikazanog pravila promjene boje odredi koja je otopina kisela, lužnata ili neutralna.



Plavi lakmusov papir mijenja boju u crvenu  
Otopina je KISELA.



Crveni lakmusov papir mijenja boju u plavu  
Otopina je LUŽNATA.

Ako se boja papirića nije promijenila otopina je NEUTRALNA.

Rezultati:

Broj čašice	Look	Smell	Feel	Kiselo Lužnato ili neutralno (zaokružiti)	Vrsta uzorka
1				K / L / N	
2				K / L / N	
3				K / L / N	

U kojoj čašici se nalazi samo voda? \_\_\_\_\_

Radionica: ~~Čovječanstvo~~ GLOBE (hidrologija) 27.11.2023.

Prirredila: Anika ~~Veselić~~ učitelj savjetnik

**Zadatak 2.** U dvije čašice nalaze se vodovodna voda i destilirana voda. **Vaš je zadatak da otkrijete koja tvar se nalazi u kojoj čašici.**

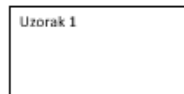
**Potreban pribor i kemikalije:** kapaljka, predmetno stakalce, svijeća lužica, vodovodna voda, destilirana voda

#### UPUTA ZA RAD:

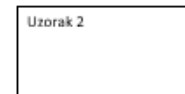
- Promotri uzorke u čašama. Primjećuješ li da su u uzorcima otopljene neke tvari? \_\_\_\_\_
- Pomoću kapaljke stavi na sredinu predmetnog stakalca 1-2 kapi prvog uzorka
- Drvenom hvataljkom uhvati stakalce za rub i pažljivo ga zagrijavaj iznad svijeće dok voda ne ispari. (stakalce drži iznad plamena pazi da ga ne zacrniš plamenom)
- Nakon zagrijavanja stavi stakalce iznad crne podloge i zabilježi opaženo.
- Postupak ponovi s ostalim uzorcima.

#### Rezultati

U pravokutnike nacrtaj svoja opažanja, a na crte ispod pravokutnika opiši što uočavaš na predmetnom stakalcu.



Uzorak 1



Uzorak 2

Na temelju rezultata pokusa odgovori na sljedeća pitanja.

a) Koji uzorak je vodovodna voda? \_\_\_\_\_

Vode koje sadržavaju veću količinu otopljenih tvari nazivamo TVRDE VODE, a one koje imaju malu količinu otopljenih tvari nazivamo MEKE VODE.

b) Uzorke vode koje ste ispitivali pokusom razvrstajte na meke i tvrde vode.

**Zadatak 3.** Otkrijete što može smanjiti prozornost vode.

**Potreban pribor i kemikalije:** jedna čaša s crno bijelim poljima na dnu, dvije čaše s vodom, zemlja (tlo), žličica, ravnalo

**UPUTA ZA RAD:** Napomena: Ako je čaša puna do vrha, a vi još uvijek vidite crno bijela polja na dnu prozornost je ~~maksimalna~~. Ako čaša nije puna do vrha, a crno bijela polja se ne vide izmjerite ravnalom visinu vodenog stupca i zabilježite vrijednost.

- Nalijevajte vodovodnu vodu iz čaše u čašu s crno bijelim poljima. Za vrijeme nalijevanja gledajte čašu odozgo. Vodu nalijevajte dok vidite crno bijela polja.
- Vratite vodu iz čaše koja ima na dnu crno bijela polja u praznu čašu i dodajte jednu žličicu zemlje u vodu i promiješajte. Ponovite mjerenje s ovom vodom kao u koraku 1.
- Ponovite mjerenje s dvije žličice zemlje.

#### Rezultati:

Uzorak	Prozornost /cm (visina vodenog stupca u čaši)
Vodovodna voda	
Vodovodna voda + 1 žličica zemlje	
Vodovodna voda + 2 žličice zemlje	

Rezultate prikažite grafički (prozornost (cm) na Y-osi i žličicama tla na X-osi)



**THE GLOBE PROGRAM**

A Worldwide Science and Education Program

## EVALUACIJA



<https://forms.gle/x1mqUgbePfeV17ad7>