

# GLOBE

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ГЛОБАЛНО УЧЕЊЕ И НАБЉУДУВАЊЕ ВО ПОЛЗА НА ЖИВОТНАТА СРЕДИНА

## ФОРМУЛАРИ ЗА ВНЕСУВАЊЕ ПОДАТОЦИ

МИНИСТЕРСТВО ЗА ЖИВОТНА СРЕДИНА И ПРОСТОРНО ПЛАНИРАЊЕ

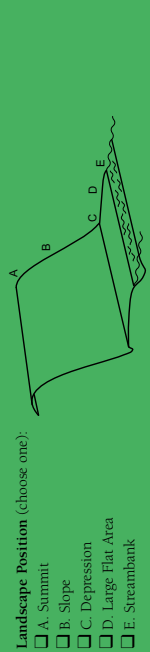
МАКЕДОНСКИ ИНФОРМАТИВЕН ЦЕНТАР ЗА ЖИВОТНА СРЕДИНА

# Soil Investigation

## Soil Characterization Site Definition Sheet

Study Site Name: SCS- \_\_\_\_\_  
 Location: Latitude: \_\_\_\_\_°  N or  S Longitude: \_\_\_\_\_°  E or  W  
 Elevation: \_\_\_\_\_ meters Slope: \_\_\_\_\_° Aspect: \_\_\_\_\_°  
 Source of Location Data (check one):  GPS  Other \_\_\_\_\_

- Method** (choose one):
- Pit
  - Auger
  - Near Surface
- Is Soil Characterization site:**
- Near the Soil Moisture Study Site
  - On school grounds
  - Off school grounds
- Site Location** (choose one):
- Near the Soil Moisture Study Site
  - Near the Soil Moisture and Atmospheric Study Sites
  - Near the Atmosphere Study Site
  - In the Biology Study Site
  - Other \_\_\_\_\_



- Cover Type:**
- Bare Soil
  - Rocks
  - Grass
  - Shrubs
  - Trees
  - Other \_\_\_\_\_
- Parent Material:**
- Bedrock
  - Organic Material
  - Construction Material
  - Marine Deposits
  - Lake Deposits
  - Stream Deposits (Alluvium)
  - Wind Deposits (Loess)
  - Glacial Deposits (Glacial Till)
  - Volcanic Deposits
  - Loose materials on slope
- Land Use:**
- Urban
  - Agricultural
  - Recreation
  - Wilderness
  - Other \_\_\_\_\_

**Distance from Major Features:** \_\_\_\_\_

**Other Distinguishing Characteristics of this Site:** \_\_\_\_\_

Horizon Number	(cm)																				
Top Depth	(cm)																				
Bottom Depth	(cm)																				
Structure	(granular, blocky, platy, prismatic, columnar, single grained, massive)																				
Main Color	(color book)																				
Second Color	(color book)																				
Consistence	(firm, extremely firm, sandy clay loam, loam, extremely firm)																				
Texture	(sand, loamy sand, sandy loam, silty clay loam, silty clay loam, clay loam, clay)																				
Rocks	(none, few, many)																				
Roots	(none, few, many)																				
Carbonates	(none, slight, strong)																				

Date of Characterization: \_\_\_\_\_ Local Time of Characterization: \_\_\_\_\_ (Hours:Min)  
 Study Site: SCS- \_\_\_\_\_ Method (choose one): \_\_\_\_\_ Pit \_\_\_\_\_ Auger \_\_\_\_\_ Near Surface \_\_\_\_\_  
 UT of Characterization: \_\_\_\_\_ (Hours:Min)

# Soil Investigation

## Soil Characterization Data Sheet

# Soil Investigation

## Soil Temperature Data Sheet

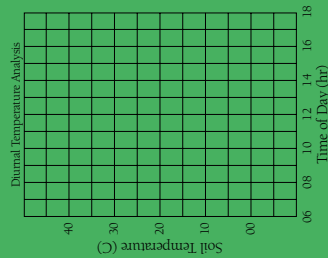
Study Site: \_\_\_\_\_  
 Name of Collector/Analyst/Recorder: \_\_\_\_\_  
 Date: \_\_\_\_\_  
 Soil Thermometer: Dial \_\_\_\_\_ Digital \_\_\_\_\_ Other \_\_\_\_\_  
 Has there been precipitation within the last 24 hours? Yes \_\_\_\_\_ No \_\_\_\_\_

### Daily/Weekly Measurements

Sample No.	Time (hr)	Temperature (min)	5 cm (C)	10 cm (C)
1	_____	_____	_____	_____
2	_____	_____	_____	_____
3	_____	_____	_____	_____

### Diurnal/Cycle Measurements

Sample No.	Time (hr)	Temperature (min)	5 cm (C)	10 cm (C)
1	_____	_____	_____	_____
2	_____	_____	_____	_____
3	_____	_____	_____	_____
4	_____	_____	_____	_____
5	_____	_____	_____	_____
6	_____	_____	_____	_____
7	_____	_____	_____	_____
8	_____	_____	_____	_____



Daily Metadata/Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

# Soil Investigation

## Soil Moisture Data Sheet - Star Pattern

Study Site: SMS- \_\_\_\_\_  
 Name of Collector/Analyst/Recorder: \_\_\_\_\_  
 Sample collection date: \_\_\_\_\_  
 Local Time: \_\_\_\_\_ (Hours:Min) UT: \_\_\_\_\_ (Hours:Min)  
 Current Conditions: Is soil saturated?  Yes  No  
 Drying Method:  95-105° C oven  75-95° C oven  microwave  
 Average Drying Time: \_\_\_\_\_ (hours or minutes)  
 Bearing from Star Center (optional): \_\_\_\_\_ Distance from Star Center: \_\_\_\_\_  
 Observations: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

### Near-Surface Samples:

Sample Number	Sample Depth	Container Number	A. Wet Weight (g)	B. Dry Weight (g)	C. Water Weight (A-B) (g)	D. Container Weight (g)	E. Dry Soil Weight (B-D) (g)	F. Soil Water Content (C/E)
1	0-5 cm	_____	_____	_____	_____	_____	_____	_____
	10 cm	_____	_____	_____	_____	_____	_____	_____
2	0-5 cm	_____	_____	_____	_____	_____	_____	_____
	10 cm	_____	_____	_____	_____	_____	_____	_____
3	0-5 cm	_____	_____	_____	_____	_____	_____	_____
	10 cm	_____	_____	_____	_____	_____	_____	_____

# Soil Investigation

## Bulk Density Data Sheet

Note: All measurements are done without the can lid!!

Date of sample collection: Year \_\_\_\_\_ Month \_\_\_\_\_ Day \_\_\_\_\_

Study Site: SCS- \_\_\_\_\_

Horizon Number: \_\_\_\_\_, Horizon Depth: Top \_\_\_\_\_ cm, Bottom \_\_\_\_\_ cm

	Sample Number		
	1	2	3
A Container volume (mL)			
B Container mass (g)			
C Wet mass of soil and container (g)			
D Dry mass of soil and container (g)			
E Mass of rocks (g)			
F Volume of water without rocks (mL)			
G Volume of water with rocks (mL)			
H Mass of dry soil (g) = D-B			
I Volume of rocks (mL) = G-F			
J Bulk Density (g/mL) = $\frac{H-E}{A-I}$			

# Soil Investigation

## Soil Particle Density Data Sheet

Note: All measurements should be made without the stopper/cap!!

Date soil is mixed with water: year \_\_\_\_\_ month \_\_\_\_\_ day \_\_\_\_\_

Study Site: \_\_\_\_\_

Horizon number: \_\_\_\_\_

How has the soil been stored since it came out of the oven? \_\_\_\_\_

Other comments: \_\_\_\_\_

	Sample Number		
	1	2	3
Mass of empty flask (g) (B below)			
Mass of soil + empty flask (g) (A below)			
Mass of water + soil +flask (g) (D below)			
Water Temperature (°C) (F below)			

### Calculation Work Sheet

	Sample Number		
	1	2	3
A Mass of soil + empty flask (g)			
B Mass of empty flask (g)			
C Mass of soil (g) (A - B)			
D Mass of water + soil +flask (g)			
E Mass of water (D - A)			
F Water Temperature (°C)			
G Density of water (g/mL) (approximately 1.0)			
H Volume of water (mL) (E/G)			
I Volume of soil (mL) (100 mL - H)			
J Soil particle density (g/mL) (C/I)			

# Soil Investigation

## Soil Particle Size Distribution Data Sheet

Date of sample collection: Year \_\_\_\_\_ Month \_\_\_\_\_ Day \_\_\_\_\_

Study Site: \_\_\_\_\_

Horizon Number: \_\_\_\_\_ Horizon Depth: Top \_\_\_\_\_ cm Bottom \_\_\_\_\_ cm

### Sample Number 1

Distance from 500 mL mark to base of graduated cylinder: \_\_\_\_\_ cm

Hydrometer Calibration Temperature: \_\_\_\_\_ °C

- A. 2 minute hydrometer reading: \_\_\_\_\_ C. 24 hour hydrometer reading: \_\_\_\_\_  
B. 2 minute temperature: \_\_\_\_\_ °C D. 24 hour temperature: \_\_\_\_\_ °C

### Sample Number 2

Distance from 500 mL mark to base of graduated cylinder: \_\_\_\_\_ cm

Hydrometer Calibration Temperature: \_\_\_\_\_ °C

- A. 2 minute hydrometer reading: \_\_\_\_\_ C. 24 hour hydrometer reading: \_\_\_\_\_  
B. 2 minute temperature: \_\_\_\_\_ °C D. 24 hour temperature: \_\_\_\_\_ °C

### Sample Number 3

Distance from 500 mL mark to base of graduated cylinder: \_\_\_\_\_ cm

Hydrometer Calibration Temperature: \_\_\_\_\_ °C

- A. 2 minute hydrometer reading: \_\_\_\_\_ C. 24 hour hydrometer reading: \_\_\_\_\_  
B. 2 minute temperature: \_\_\_\_\_ °C D. 24 hour temperature: \_\_\_\_\_ °C

# Soil Investigation

## Soil pH Data Sheet

Date of sample collection: \_\_\_\_\_ Study Site: \_\_\_\_\_

Horizon Number: \_\_\_\_\_ Horizon Depth: Top \_\_\_\_\_ cm Bottom \_\_\_\_\_ cm

**Sample Number 1 – pH Measurement method (check one):**  paper  meter

A. pH of water before adding soil \_\_\_\_\_ B. pH of soil and water mixture \_\_\_\_\_

**Sample Number 2 – pH Measurement method (check one):**  paper  meter

A. pH of water before adding soil \_\_\_\_\_ B. pH of soil and water mixture \_\_\_\_\_

**Sample Number 3 – pH Measurement method (check one):**  paper  meter

A. pH of water before adding soil \_\_\_\_\_ B. pH of soil and water mixture \_\_\_\_\_

Horizon Number: \_\_\_\_\_ Horizon Depth: Top \_\_\_\_\_ cm Bottom \_\_\_\_\_ cm

**Sample Number 1 – pH Measurement method (check one):**  paper  meter

A. pH of water before adding soil \_\_\_\_\_ B. pH of soil and water mixture \_\_\_\_\_

**Sample Number 2 – pH Measurement method (check one):**  paper  meter

A. pH of water before adding soil \_\_\_\_\_ B. pH of soil and water mixture \_\_\_\_\_

**Sample Number 3 – pH Measurement method (check one):**  paper  meter

A. pH of water before adding soil \_\_\_\_\_ B. pH of soil and water mixture \_\_\_\_\_

Horizon Number: \_\_\_\_\_ Horizon Depth: Top \_\_\_\_\_ cm Bottom \_\_\_\_\_ cm

**Sample Number 1 – pH Measurement method (check one):**  paper  meter

A. pH of water before adding soil \_\_\_\_\_ B. pH of soil and water mixture \_\_\_\_\_

**Sample Number 2 – pH Measurement method (check one):**  paper  meter

A. pH of water before adding soil \_\_\_\_\_ B. pH of soil and water mixture \_\_\_\_\_

**Sample Number 3 – pH Measurement method (check one):**  paper  meter

A. pH of water before adding soil \_\_\_\_\_ B. pH of soil and water mixture \_\_\_\_\_

# Soil Investigation

## Soil Fertility Data Sheet

Date of Sample Collection: \_\_\_\_\_ Study Site: \_\_\_\_\_  
 Horizon Number: \_\_\_\_\_ Horizon Depth: Top \_\_\_\_\_ cm Bottom \_\_\_\_\_ cm

### Sample Number 1

Nitrate (N): High \_\_\_ Med \_\_\_ Low \_\_\_ None \_\_\_  
 Phosphorus (P): High \_\_\_ Med \_\_\_ Low \_\_\_ None \_\_\_  
 Potassium (K): High \_\_\_ Med \_\_\_ Low \_\_\_ None \_\_\_

### Sample Number 2

Nitrate (N): High \_\_\_ Med \_\_\_ Low \_\_\_ None \_\_\_  
 Phosphorus (P): High \_\_\_ Med \_\_\_ Low \_\_\_ None \_\_\_  
 Potassium (K): High \_\_\_ Med \_\_\_ Low \_\_\_ None \_\_\_

### Sample Number 3

Nitrate (N): High \_\_\_ Med \_\_\_ Low \_\_\_ None \_\_\_  
 Phosphorus (P): High \_\_\_ Med \_\_\_ Low \_\_\_ None \_\_\_  
 Potassium (K): High \_\_\_ Med \_\_\_ Low \_\_\_ None \_\_\_

Date of Sample Collection: \_\_\_\_\_ Study Site: \_\_\_\_\_  
 Horizon Number: \_\_\_\_\_ Horizon Depth: Top \_\_\_\_\_ cm Bottom \_\_\_\_\_ cm

### Sample Number 1

Nitrate (N): High \_\_\_ Med \_\_\_ Low \_\_\_ None \_\_\_  
 Phosphorus (P): High \_\_\_ Med \_\_\_ Low \_\_\_ None \_\_\_  
 Potassium (K): High \_\_\_ Med \_\_\_ Low \_\_\_ None \_\_\_

### Sample Number 2

Nitrate (N): High \_\_\_ Med \_\_\_ Low \_\_\_ None \_\_\_  
 Phosphorus (P): High \_\_\_ Med \_\_\_ Low \_\_\_ None \_\_\_  
 Potassium (K): High \_\_\_ Med \_\_\_ Low \_\_\_ None \_\_\_

### Sample Number 3

Nitrate (N): High \_\_\_ Med \_\_\_ Low \_\_\_ None \_\_\_  
 Phosphorus (P): High \_\_\_ Med \_\_\_ Low \_\_\_ None \_\_\_  
 Potassium (K): High \_\_\_ Med \_\_\_ Low \_\_\_ None \_\_\_

Date of Sample Collection: \_\_\_\_\_ Study Site: \_\_\_\_\_  
 Horizon Number: \_\_\_\_\_ Horizon Depth: Top \_\_\_\_\_ cm Bottom \_\_\_\_\_ cm

### Sample Number 1

Nitrate (N): High \_\_\_ Med \_\_\_ Low \_\_\_ None \_\_\_  
 Phosphorus (P): High \_\_\_ Med \_\_\_ Low \_\_\_ None \_\_\_  
 Potassium (K): High \_\_\_ Med \_\_\_ Low \_\_\_ None \_\_\_

### Sample Number 2

Nitrate (N): High \_\_\_ Med \_\_\_ Low \_\_\_ None \_\_\_  
 Phosphorus (P): High \_\_\_ Med \_\_\_ Low \_\_\_ None \_\_\_  
 Potassium (K): High \_\_\_ Med \_\_\_ Low \_\_\_ None \_\_\_

### Sample Number 3

Nitrate (N): High \_\_\_ Med \_\_\_ Low \_\_\_ None \_\_\_  
 Phosphorus (P): High \_\_\_ Med \_\_\_ Low \_\_\_ None \_\_\_  
 Potassium (K): High \_\_\_ Med \_\_\_ Low \_\_\_ None \_\_\_

# Soil Investigation

## Digital Multi-Day Soil Thermometer Calibration and Reset Data Sheet

School Name: \_\_\_\_\_ Study Site: \_\_\_\_\_  
 Observer Names: \_\_\_\_\_

### Calibration

Reading Number	Thermometer Readings			
	Date (yy/mm/dd)	Local Time (hour:min)	Universal Time (hour:min)	Calibration Thermometer Readings (°C)
1				Digital 30 cm Sensor Readings (°C)
2				Digital 5 cm Sensor Readings (°C)
3				
4				
5				

### Time of Reset

Note: The thermometer should be reset only when it is first setup, after the battery is changed, or if the time of local solar noon drifts to more than one hour from your time of reset.

Date: \_\_\_\_\_ Local time (Hour:Min) \_\_\_\_\_ Universal time (Hour:Min) \_\_\_\_\_  
 Was the reset due to a battery change? \_\_\_\_\_

### 5 cm Sensor Check

Reading Number	Thermometer Readings			
	Date (yy/mm/dd)	Local Time (hour:min)	Universal Time (hour:min)	Soil Probe Thermometer Readings at 5 cm (°C)
1				Digital 5 cm Sensor Readings (°C)
2				
3				
4				
5				

# Soil Investigation

## Digital Multi-Day Soil Thermometer Data Sheet

School Name: \_\_\_\_\_ Study Site: \_\_\_\_\_

Observer Names: \_\_\_\_\_

Date: Year \_\_\_\_\_ Month \_\_\_\_\_ Day \_\_\_\_\_

Local time (Hour:Min): \_\_\_\_\_ Universal time (Hour:Min): \_\_\_\_\_

Your Time of Reset in universal time (Hour:Min): \_\_\_\_\_

### Current Temperatures

5 cm soil temperature (°C): \_\_\_\_\_

50 cm soil temperature (°C): \_\_\_\_\_

### Maximum, Minimum Temperatures

Do not read the thermometer within 5 minutes of your time of reset.

	Label on Digital Display Screen					
	D1	D2	D3	D4	D5	D6
Maximum 5 cm Temperature (°C)						
Minimum 5 cm Temperature (°C)						
Maximum 50 cm Temperature (°C)						
Minimum 50 cm Temperature (°C)						
If you are reading the thermometer AFTER your time of reset: Correspond to 24-hour Period Ending:	Today	Yesterday	Two days ago	Three days ago	Four days ago	Five days ago
If you are reading the thermometer BEFORE your time of reset: Correspond to 24-hour Period Ending:	Yesterday	Two days ago	Three days ago	Four days ago	Five days ago	Six days ago

# Soil Investigation

## Soil Infiltration Data Sheet

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

Name of Collector/Analyst/Recorder: \_\_\_\_\_

Sample collection

• date: \_\_\_\_\_

• time: \_\_\_\_\_ (hours and minutes) check one: UT \_\_\_\_\_ Local \_\_\_\_\_

Distance to Soil Moisture Site \_\_\_\_\_ m

Sample Set number: \_\_\_\_\_ Width of your reference band: \_\_\_\_\_ mm

Diameter: Inner Ring: \_\_\_\_\_ cm Outer Ring: \_\_\_\_\_ cm

Heights of reference band above ground level: Upper: \_\_\_\_\_ mm Lower: \_\_\_\_\_ mm

### Directions:

Take 3 sets of infiltration rate measurements within a 5 m diameter area. Use a different data work sheet for each set. Each set consists of multiple timings of the same water level drop or change until the flow rate becomes constant or 45 minutes is up. Record your data below for one set of infiltration measurements you take.

The form below is setup to help you calculate the flow rate.

For data analysis, plot the Flow Rate (F) vs. Midpoint time (D).

### Observations:

A.	B.	C.	D.	E.	F.
Start (min)	End (min)	Interval (min) (B-A)	Midpoint (min) (A+C/2)	Water Level Change (mm)	Flow Rate (mm/min) (E/C)
1	_____	_____	_____	_____	_____
2	_____	_____	_____	_____	_____
3	_____	_____	_____	_____	_____
4	_____	_____	_____	_____	_____
5	_____	_____	_____	_____	_____
6	_____	_____	_____	_____	_____
7	_____	_____	_____	_____	_____
8	_____	_____	_____	_____	_____
9	_____	_____	_____	_____	_____

Saturated Soil Water Content below infiltrometer after the experiment:

A. Wet Weight: \_\_\_\_\_ g B. Dry Weight: \_\_\_\_\_ g C. Water Weight (A-B): \_\_\_\_\_ g

D. Container Weight: \_\_\_\_\_ g E. Dry Soil Weight (B-D): \_\_\_\_\_ g

F. Soil Water Content (C/E) \_\_\_\_\_

Daily Metadata/Comments: (optional) \_\_\_\_\_

# Soil Investigation

## Textural Triangle 3

