

GeoTroopers

It's time to test your science & navigation skills!

Team Members: _____ Team Color: _____

Use the Challenge Cards to help you find the information needed to complete this assignment.

First – Calculate the waypoint using the information given and then use the GPS unit to find the location.

Second – Complete the task listed on the Challenge Card or hidden in the microcache (film canister).

All microcaches must be left EXACTLY as you found them – paper inside and in same spot!

Challenge # _____
A # _____ - _____
B # _____ - _____
C # _____ - _____
D # _____ - _____

Challenge # _____
A # _____ - _____
B # _____ - _____
C # _____ - _____
D # _____ - _____

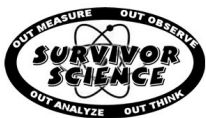
Challenge # _____
A # _____ - _____
B # _____ - _____
C # _____ - _____
D # _____ - _____

Challenge # _____
A # _____ - _____
B # _____ - _____
C # _____ - _____
D # _____ - _____

Challenge # _____
A # _____ - _____
B # _____ - _____
C # _____ - _____
D # _____ - _____

Challenge # _____
A # _____ - _____
B # _____ - _____
C # _____ - _____
D # _____ - _____

Tie Breaker: Choose a number between 1 and 100 - _____



Challenge #1

#1A

Waypoint:

of months in a year + 4

Task:

Use the Tree ID Guide to identify this tree.

#1B

Waypoint:

Atomic Mass of Nitrogen (rounded)

Task:

What type of plant is this? Hint: Its name might make you think of a feline.

#1C

Waypoint:

of legs on an insect

Task:

Find the microcache at this location and use the Insect ID book to help you identify the order to which the insect belongs. Replace it EXACTLY where you found it!

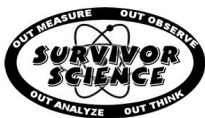
#1D

Waypoint:

of protons in Potassium

Task:

Find the microcache at this location and answer the question inside. Replace it EXACTLY where you found it!



Challenge #2

#2A

Waypoint:

of letters in the name of element Si x 3

Task:

Use the Tree ID Guide to identify this tree.

#2B

Waypoint:

of letters in the name of the animal group that contains crabs, lobsters, and shrimp (plural form)

Task:

What type of plant is this? Hint: Monarchs need this plant!

#2C

Waypoint:

of extra day(s) in a leap year

Task:

Find the microcache at this location and use the Insect ID book to help you identify the order to which the insect belongs. Replace it EXACTLY where you found it!

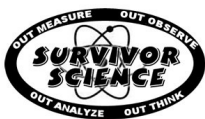
#2D

Waypoint:

of valence electrons in an atom of Boron

Task:

Find the microcache at this location and answer the question inside. Replace it EXACTLY where you found it!



Challenge #3

#3A

Waypoint:

of letters in the animal group that contains spiders + 8 (plural form)

Task:

Use the Tree ID Guide to identify this tree.

#3B

Waypoint:

of letters in the name of a square yellow cartoon character that lives in Bikini Bottom

Task:

What type of plant is this? Hint: It might be used in chewing gum and tea.

#3C

Waypoint:

The “unlucky” number – Friday the ___th

Task:

Find the microcache at this location and use the Insect ID book to help you identify the order to which the insect belongs. Replace it EXACTLY where you found it!

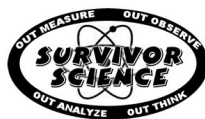
#3D

Waypoint:

of electrons in an atom of Titanium

Task:

Find the microcache at this location and answer the question inside. Replace it EXACTLY where you found it!



Challenge #4

#4A

Waypoint:

of neutrons in an atom of Be

Task:

Use the Tree ID Guide to identify this tree.

#4B

Waypoint:

of letters in the name of the group that contains frogs and toads (plural form)

Task:

What type of plant is this? Hint: This plant is used for perfumes and is also the name for a light-purple color.

#4C

Waypoint:

of electrons in an atom of Calcium

Task:

Find the microcache at this location and use the Insect ID book to help you identify the order to which the insect belongs. Replace it EXACTLY where you found it!

#4D

Waypoint:

of letters in the term for animals that eat other animals – 3 (plural form)

Task:

Find the microcache at this location and answer the question inside. Replace it EXACTLY where you found it!



Challenge #5

#5A

Waypoint:

of legs on an arachnid

Task:

Use the Tree ID Guide to identify this tree.

#5B

Waypoint:

of letters in the name of element Sn x 5

Task:

What type of plant is this? Hint: It is the same name as Donald Duck's girlfriend.

#5C

Waypoint:

of protons in an atom of Manganese - 1

Task:

Find the microcache at this location and use the Insect ID book to help you identify the order to which the insect belongs. Replace it EXACTLY where you found it!

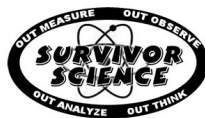
#5D

Waypoint:

Number of energy levels in Potassium.

Task:

Find the microcache at this location and answer the question inside. Replace it EXACTLY where you found it!



Challenge #6

#6A

Waypoint:

of electrons in an atom of Argon

Task:

Use the Tree ID Guide to identify this tree.

#6B

Waypoint:

of months in a leap year

Task:

What type of plant is this? Hint: The name might refer to a girl with dark eyes.

#6C

Waypoint:

Number of valence electrons in an atom of Mg

Task:

Find the microcache at this location and use the Insect ID book to help you identify the order to which the insect belongs. Replace it EXACTLY where you found it!

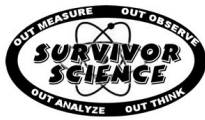
#6D

Waypoint:

Number of protons in an atom of Na +
Number of protons in an atom of Mg

Task:

Find the microcache at this location and answer the question inside. Replace it EXACTLY where you found it!



Challenge #7

#7A

Waypoint:

If an organism has a total of 40 chromosomes, how many would each sex cell have?

Task:

How would you classify this tree?
Choose one: Deciduous or Conifer

#7B

Waypoint:

of neutrons in an atom of Ti

Task:

Unscramble the letters to figure out the name of this plant: H L O L Y H C O K

#7C

Waypoint:

of days in February (not a leap year) - 1

Task:

Find the microcache at this location and use the Insect ID book to help you identify the order to which the insect belongs. Replace it EXACTLY where you found it!

#7D

Waypoint:

of electrons in an atom of Fe - 1

Task:

Find the microcache at this location and answer the question inside. Replace it EXACTLY where you found it!

Print the questions and pictures below. Place each one in a film canister to create a microcache and hide at the specified waypoints.

#1D – What type of consumer eats insects? An example is a frog.

#2D – What provides all the energy in a food web? Hint: It is a star!

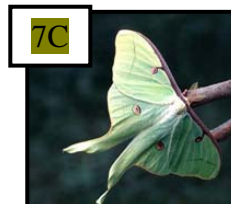
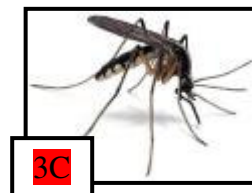
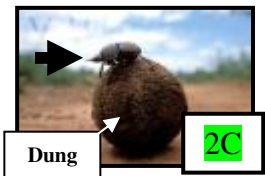
#3D – What type of organism supplies all the food for an ecosystem? Choose one: Producer, Consumer, or Decomposer

#4D – What type of consumer eats plankton (the microscopic organisms that live in water)?

#5D – Give an example of a biotic factor that is found in the schoolyard habitat.

#6D – How would carnivores, omnivores, and herbivores be classified? Choose one: Producer, Consumer, or Decomposer

#7D – How are molds, fungi, and bacteria classified? Choose one: Producer, Consumer, or Decomposer



Answer Key:

Challenge 1

- A – Waypoint = 16, Tree = Dogwood
- B – Waypoint = 14, Plant = Cattails
- C – Waypoint = 6, Insect = Lepidoptera
- D – Waypoint = 19, Plant = Insectivore

Challenge 2

- A – Waypoint = 21, Tree = Blue Spruce
- B – Waypoint = 11, Plant = Milkweed
- C – Waypoint = 1, Insect = Coleoptera
- D – Waypoint = 3, Plant = Sun

Challenge 3

- A – Waypoint = 17, Tree = Pin Oak
- B – Waypoint = 9, Plant = Mint
- C – Waypoint = 13, Insect = Diptera
- D – Waypoint = 22, Plant = Producer

Challenge 4

- A – Waypoint = 5, Tree = Sweet Gum
- B – Waypoint = 10, Plant = Lavender
- C – Waypoint = 20, Insect = Orthoptera
- D – Waypoint = 7, Plant = Planktivore

Challenge 5

- A – Waypoint = 8, Tree = White Oak
- B – Waypoint = 15, Plant = Daisy
- C – Waypoint = 24, Insect = Odonata
- D – Waypoint = 4, Plant = Any living thing

Challenge 6

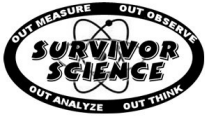
- A – Waypoint = 18, Tree = Elm
- B – Waypoint = 12, Plant = Black-eyed Susan
- C – Waypoint = 2, Insect = Hymenoptera
- D – Waypoint = 23, Plant = Consumer

Challenge 7

- A – Waypoint = 20, Tree = Conifer
- B – Waypoint = 26, Plant = Holly Hock
- C – Waypoint = 27, Insect = Lepidoptera
- D – Waypoint = 25, Plant = Decomposer

Don't have GPS units? Use colored flags with numbers on them or another type of marker that the kids can look for in the schoolyard. You might also provide a map of the schoolyard with the numbers listed at each location.

Each tribe received a tree identification book, a Golden Guide: Insects book, a copy of a periodic table, and copies of the Ecology and Animal World textbooks. I give tribes 10 to 15 minutes on the day before this challenge to review and record notes that they may use on the challenge. You can also provide the "Things to Know" handout on the next page.



Things To Know ...

Ecology Review

Producers – Source of all the food in an ecosystem

Consumer – Organisms that cannot produce their own food; carnivores, herbivores, omnivores, insectivores, and plantivores

Decomposers – Organisms that break down dead plants and animals; molds, fungi, and bacteria

Food Chain – Shows the relationships of animals in an ecosystem.

Food Web – A collection of all the food chains in an ecosystem

Biotic – The living things in an ecosystem; plants and animals

Abiotic – The nonliving things in an ecosystem; air, water, soil, rocks, etc.

1	← Atomic Number - # of protons or electrons
H	← Symbol & Name
Hydrogen	
1.00794	← Atomic Mass - # of protons + neutrons

Types of Trees

Deciduous – Trees that lose their leaves each fall

Coniferous – Trees that produce cones and needles with some needles staying on the tree all year long

of Valence Electrons = Family (column)
of Energy Levels = Period (row)

alkali metals I A										alkaline earth metals II A										nonmetals										noble gases 0
Period 1	1 H 1.01 Hydrogen																			2 He 4.00 Helium										
Period 2	3 Li 6.94 Lithium	4 Be 9.01 Beryllium																	5 B 10.81 Boron	6 C 12.01 Carbon	7 N 14.01 Nitrogen	8 O 16.00 Oxygen	9 F 19.00 Fluorine	10 Ne 20.18 Neon						
Period 3	11 Na 22.99 Sodium	12 Mg 24.31 Magnesium	transition metals										13 Al 26.98 Aluminum	14 Si 28.09 Silicon	15 P 30.97 Phosphorus	16 S 32.07 Sulfur	17 Cl 35.45 Chlorine	18 Ar 39.95 Argon												
Period 4	19 K 39.10 Potassium	20 Ca 40.08 Calcium	21 Sc 44.96 Scandium	22 Ti 47.88 Titanium	23 V 50.94 Vanadium	24 Cr 52.00 Chromium	25 Mn 54.95 Manganese	26 Fe 55.85 Iron	27 Co 58.93 Cobalt	28 Ni 58.70 Nickel	29 Cu 63.55 Copper	30 Zn 65.39 Zinc	31 Ga 69.72 Gallium	32 Ge 72.61 Germanium	33 As 74.92 Arsenic	34 Se 78.96 Selenium	35 Br 79.90 Bromine	36 Kr 83.80 Krypton												
Period 5	37 Rb 85.47 Rubidium	38 Sr 87.62 Strontium	39 Y 88.91 Yttrium	40 Zr 91.22 Zirconium	41 Nb 92.91 Niobium	42 Mo 95.94 Molybdenum	43 Tc (98) Technetium	44 Ru 101.07 Ruthenium	45 Rh 102.91 Rhodium	46 Pd 106.4 Palladium	47 Ag 107.87 Silver	48 Cd 112.41 Cadmium	49 In 114.82 Indium	50 Sn 118.71 Tin	51 Sb 121.74 Antimony	52 Te 127.60 Tellurium	53 I 126.90 Iodine	54 Xe 131.29 Xenon												
Period 6	55 Cs 132.91 Cesium	56 Ba 137.33 Barium	Lanthanide series (see below)		72 Hf 178.49 Hafnium	73 Ta 180.94 Tantalum	74 W 183.85 Tungsten	75 Re 186.21 Rhenium	76 Os 190.23 Osmium	77 Ir 192.22 Iridium	78 Pt 195.08 Platinum	79 Au 196.97 Gold	80 Hg 200.59 Mercury	81 Tl 204.38 Thallium	82 Pb 207.2 Lead	83 Bi 208.98 Bismuth	84 Po (209) Polonium	85 At (210) Astatine	86 Rn (222) Radon											
Period 7	87 Fr (223) Francium	88 Ra 226.03 Radium	Actinide series (see below)		104 Rf (261) Rutherfordium	105 Db (262) Dubnium	106 Sg (263) Seaborgium	107 Bh (262) Bohrium	108 Hs (265) Hassium	109 Mt (266) Meitnerium	110 (269) Darmstadtium	111 (272) Roentgenium	112 (277) Copernicium			114 (281) Flerovium	116 (289) Livermorium	118 (293) Oganesson												
rare earth elements—Lanthanide series			57 La 138.91 Lanthanum	58 Ce 140.12 Cerium	59 Pr 140.91 Praseodymium	60 Nd 144.24 Neodymium	61 Pm (145) Promethium	62 Sm 150.4 Samarium	63 Eu 151.96 Europium	64 Gd 157.25 Gadolinium	65 Tb 158.93 Terbium	66 Dy 162.50 Dysprosium	67 Ho 164.93 Holmium	68 Er 167.26 Erbium	69 Tm 168.93 Thulium	70 Yb 173.04 Ytterbium	71 Lu 174.97 Lutetium													
Actinide series			89 Ac 227.03 Actinium	90 Th 232.04 Thorium	91 Pa 231.04 Protactinium	92 U 238.03 Uranium	93 Np 237.05 Neptunium	94 Pu (244) Plutonium	95 Am (243) Americium	96 Cm (247) Curium	97 Bk (247) Berkelium	98 Cf (251) Californium	99 Es (252) Einsteinium	100 Fm (257) Fermium	101 Md (258) Mendelevium	102 No (259) Nobelium	103 Lr (260) Lawrencium													