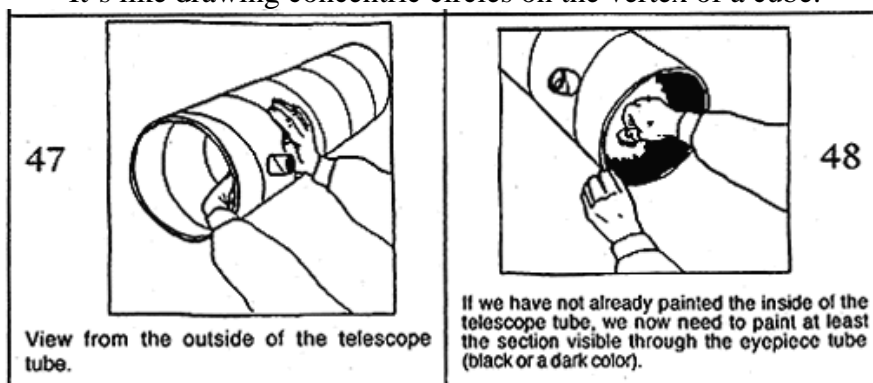


It's like drawing concentric circles on the vertex of a cube.



I prefer using a dark color.

This trip slip conveniently printed on melon slice paper...ha, no, still white.
{look for other colors to appear on future trip slips, courtesy of Kinko's, but not really}

Today and/or tomorrows trip (depending on when you read this):

ARNOLD ARBORETUM.

A SLICE OF HEAVEN, REALLY FAR AWAY.

Pertinent Information:

Ts# (trip slip number): 15

D|t (date and times): July 25, 2006 / 9am-4pm

Ml (meeting location): Brown middle school

L (leader): Jonathan Rivnay {617.527.1849} & Nate Kaufman {617.969.4144}

vEq (various equipment): Hiking Boots, lots of Water (4+ litres, por favor), huge Lunch, Field Kit (Raingear, First Aid, etc.), and some good extra food for your leader.

Informational Haikus {i5|7|5}:

Another long trip.
But mountain sequence awaits!
Trip is five [mi] away.

Lets learn about trees.
But wait! There's more to learn here:
Birds, Bonsais, Maint'nance

Arnold Arbor'tum:
Owned/Op'rated by Harvard.
Now that's pretentious!

Evolution of...
(you know this one will be great)
...phytochrome systems!

Boston.com predicts:

Tuesday,
July 25, 2006



sunny?
H:W / L:L

So it's a little far ahead for
weather, but they do predict Red
Sox @ Oakland A's at 10:05pm.
Pretty safe prediction.
*My conclusion: Sounds hot just
reading that. Bring a ton of
water.*

ARNOLD ARBORETUM

ARNOLD ARBORETUM

Leaders: Nate "Stagnant" Kaufman (617-969-4144)

Jonathan "Papelon" Rivnay (617)-645-1379

WHAT TO BRING

Field kit, hiking boots, loads of water, big lunch, sunblock, a couple \$bucks\$ if you want to buy some fresh fruit on the way home.

DID YOU KNOW...

Arnold Arboretum is a 265-acre expanse of trees and shrubs, both local and exotic! It is tended by Harvard University (#1 in obnoxious tour guides), and has been since 1872.

These trees, etc. are maintained for the viewing pleasure of the public, so we can view them, learn about them, and have a grand ole time!

This is really a great trip on which to sum up the day trips of the month. We'll identify as many trees & plants as we can, plus it's

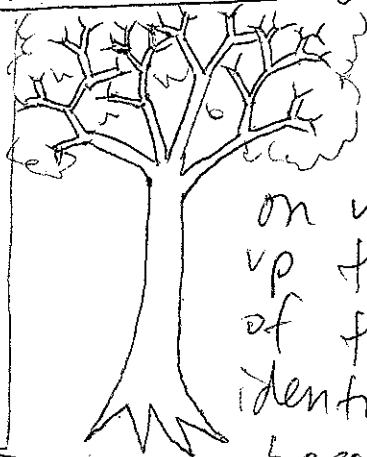
a pretty hefty distance to walk, which we be great preparation for the mountain sequence - which is now only

ONE DAY AWAY!

So get excited! It's gonna rock!

In case of Emergency, your child will be brought to:
Newton Wellesley Hospital: 617-243-6000.

This program must comply with the regulations of the Massachusetts Dept. of Public Health and must be licensed by the City of Newton Health Department.



ARNOLD ARBORETUM

Location: Brown

Times: 9 - 4

Leads:

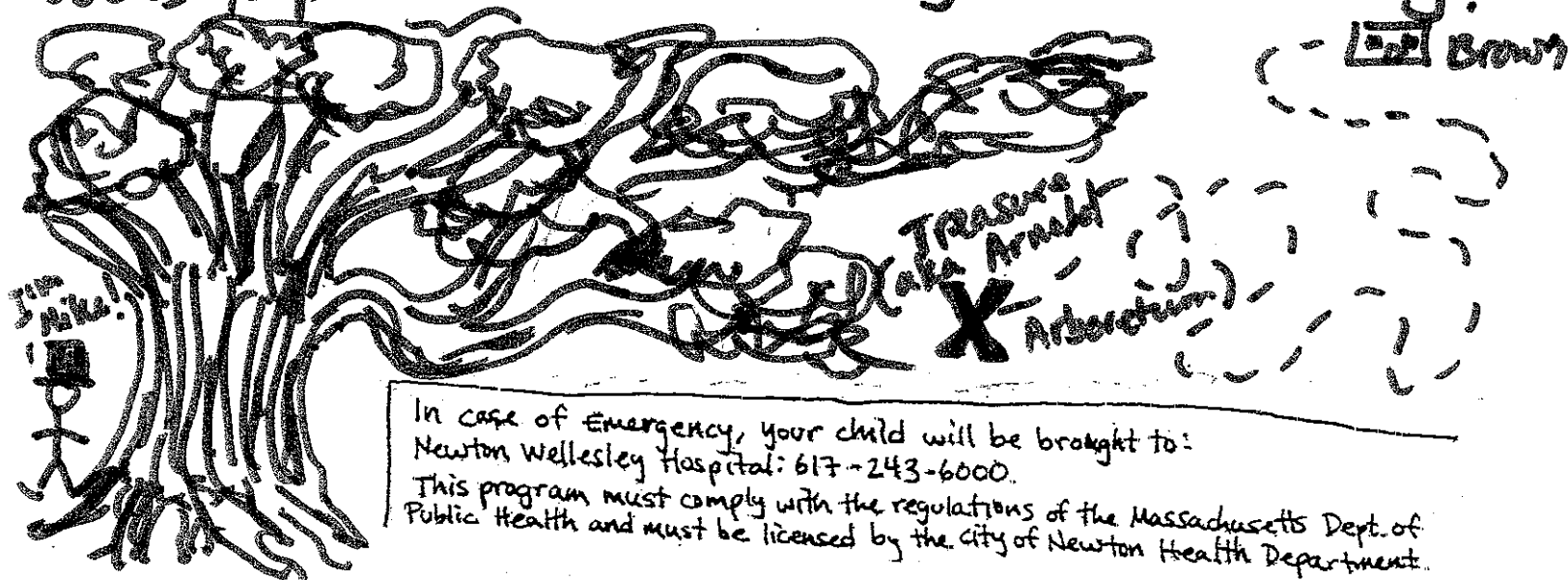
Lyuda Kovalchuk
617-558-5567

Justeen Shier
617-965-6378

Trip slip # 11 7/19/06

Equipment: lunch, lots of water, raingear, 1st aid,
2 pairs of socks, hiking boots, sunscreen

Hi, mates, it seems that ~~you~~ on the morrow
you'll be setting off on a very exciting adventure
indeed! We're going to sail the seven seas of
Newton and end up in a magical tree sanctuary -
the Arnold Arboretum! It'll be a pretty long
walk, but the reward will be handsome... We're
gonna get to see lots of different tree species
and learn some cool facts about how trees live
and work. Since it is a long walk, make sure
to bring lots of water and to wear two pairs of
socks to prevent blisters. See you on Wednesday!



In case of Emergency, your child will be brought to:
Newton Wellesley Hospital: 617-243-6000.

This program must comply with the regulations of the Massachusetts Dept. of
Public Health and must be licensed by the City of Newton Health Department.

Leaders Justin "Hungry Hungry" Cheever Lyda "Coco" Kovalchuk
617-965-6378 617-558-5567

9-4



- Stuff the bring
- 2 litres water
 - Field Kit
 - Rain gear
 - Sunscreen / Bug spray
 - Lunch
 - 2 pair o' socks
 - Boots

Arnold Arboretum is all about trees, so naturally we will be learning aaaaallll about them. We will

be learning about forest succession and how forest is probably the best thing in the entire universe.

Did you know that trees have several layers of wood that make up its structure they all serve their own special purposes.

like carry nutrients, protecting the tree, and giving it support. Be sure to bring lots of water, because this a super long trip.

In case you forgot

red pine

2 needle

pitch pine

3 needles

white pine

5 needle

In case of Emergency, your child will be brought to:
Newton Wellesley Hospital: 617-243-6000.

This program must comply with the regulations of the Massachusetts Dept. of Public Health and must be licensed by the City of Newton Health Department.

ARNOLD ARBORETUM

Leaders: Mike "David" McLellan 617-244-0998
Jeff "Arnold" DeCew 617-964-7145
Meet at: Brown Middle School Time: 9-4

What to bring: water, lunch,
raingear, first aid, day kit



I'm Arnold and you
are going to my
Arboretum.

Welcome to the wonderful world of arboretums. If you have no idea what an arboretum is, we will break the word down. Arbor is from the Greek word for "tree", e is the Egyptian word for "super amazing fun time", and tum is the Olmec word for "park". So if we add this all together we learn that arboretum is/means "a super amazing tree fun park time". In conclusion, the Arnold Arboretum is a park full of all types of trees, some beautiful, some delicious, and others beautifully tasty. Of course we aren't going to be eating any. Instead, we will walk to the Arnold Arboretum and gaze at the trees longingly, thinking about how good they would taste with some stir-fry noodles. To tide us over, we may stop at a local farm and buy some even more delicious vegetables that are good for your health.

Here is an example of a tree:



Here is an example of a farm:



In case of emergency, the nearest hospital is: Newton Wellesley 617-243-6000
This program must comply with the regulations of the Massachusetts Dept of Health and must be licensed by the city of Newton Health Dept.



ARBORETUM

Gordon Roble
Trip slip #11
7/18/95

Leaders - Gordon Roble - 244-9384

Location - Brown Jr. High

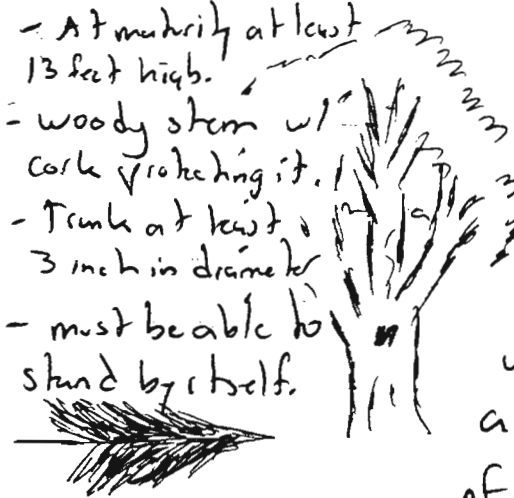
Times - 9:00 am - 3:00 pm

Equipment - lunch boxes, H₂O (bottles)
Swing gear and field kits, 2 pairs
of socks.

Today we are going to what has been called the greatest garden in America. It is filled with trees from all over the world, including some amazing bonsai trees. So one thing that is very important is that we know how to tell the difference between a tree and a shrub.

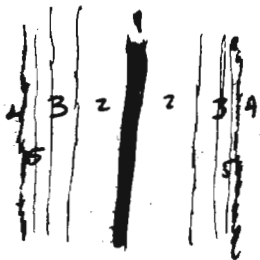
A tree

- At maturity at least 13 feet high.
- woody stem w/ cork protecting it.
- Trunk at least 3 inch in diameter
- must be able to stand by itself.



While we are at the arboretum we will also learn how a plant/tree goes about making its food, and then how it distributes it through-out the rest of the tree. We will also learn why this process is important to the rest of the world. Besides this process which, incidentally gives us Oxygen, we will see why a tree is important in maintaining the general strength of the ground with its roots.

This is a tree bit



1. Heartwood - aged wood which provides tree with a core
2. Sapwood - the living part of the tree - has sap in it

Pinnately compound leaf (1 leaf)

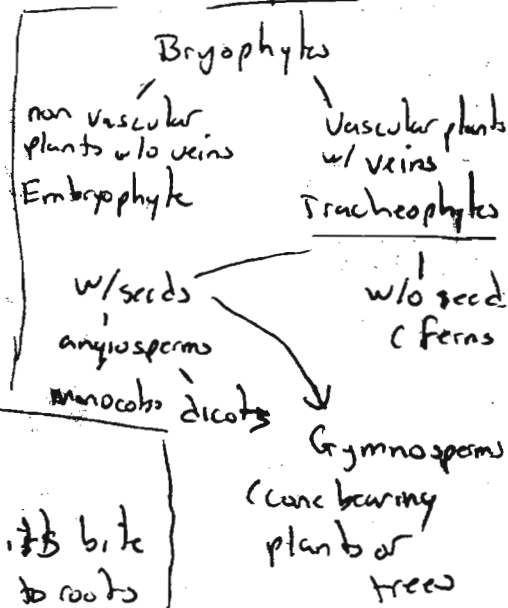
Palmately compound leaf (1 leaf)

Simple leaf

Palmately lobed

3. Cambium - area in which the tree grows wider
4. The bark - its worse than its bite
5. Phloem - carries food to roots

land plants



Arnold Arboretum

Trip-slip #9

Leaders:

Jeff "On The Run" DeCew

617-964-7845

Mikey "Money" McLellan

617-244-0998

Special Items:

≈ \$5 for
organic treats

Required Items:

WATER (2 quarts)

A Yummy Lunch

Field Kit a la you

Raingear

First Aid

Notebook

Sun screen

Optional Items:

Something for
show and tell.

A TREE book for
identifying all of the
many kinds of trees
we will see!

Meeting Place:

Brown Middle
School!

Times:

Meet: 9:00 AM

Leave 4:00 PM

So, who knows what an arboretum is?

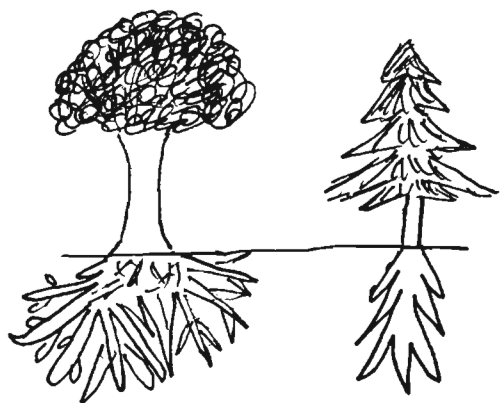
That's right! An arboretum is a place
where a great variety of trees and
bushes are grown, either for research
or for beauty. Basically, a big tree
Lab or garden.

So, now that we know what it is,
why are we going there? Well, clearly
we want to both learn about the
trees and bask in their beauty. It's
also a great field for some cool games.

Now, who the heck is Arnold?

While this is not the most important
question, I will address it on the
trip. After all, it is a pretty significant
distance we are walking. But don't worry,
on our way back we will stop at a
small market for some fresh grown treats.

So, another thing we will talk about
is how we manage to keep the
powerful force of forest succession
at bay, so we can have a nice,
sparsely populated field of trees.
If you think you've figured it out,
you could win a prize.



In case of an emergency, your child will be brought to: Newton-Wellesley Hospital -- 617-243-6000

This program must comply with the regulations of the Massachusetts Department of Public Health and must be licensed by the City of Newton Health Department.

Leaders: Jeff DeCew
617-964-7845
Amelia Runyan
617-244-8836

trip slip # 14

yay !!

ARNOLD ARBORETUM

Equipment:

Boots

Water (2 liters)

Huge Lunch

Field Kit

Rain gear

Bug spray

First aid

Note book

Sun Screen

(possible money \$)

Meeting Place

Brown Middle
School

Meeting time

9:00

What is an Arboretum?

An arboretum is a special place in which a collection of rare trees and shrubs is cultivated for scientific or educational purposes.

Arnold Arboretum is a group which manages 265 acres of land in Boston which holds many varieties of trees, shrubs, vines, and other plants.

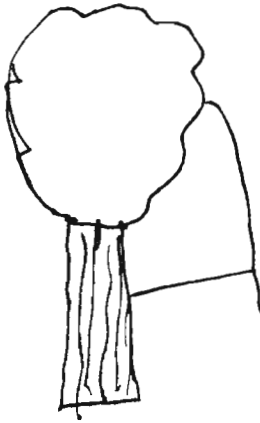
Our location was founded in 1872, and now holds over 1,507,083 specimens, including original inhabitants.

You might wanna bring \$ for some food at the farm we will stop at.

Meet at: EMS

Times: 9-4

Leaders: Sarina Yospin
(969-3966)



Arnold Arboretum

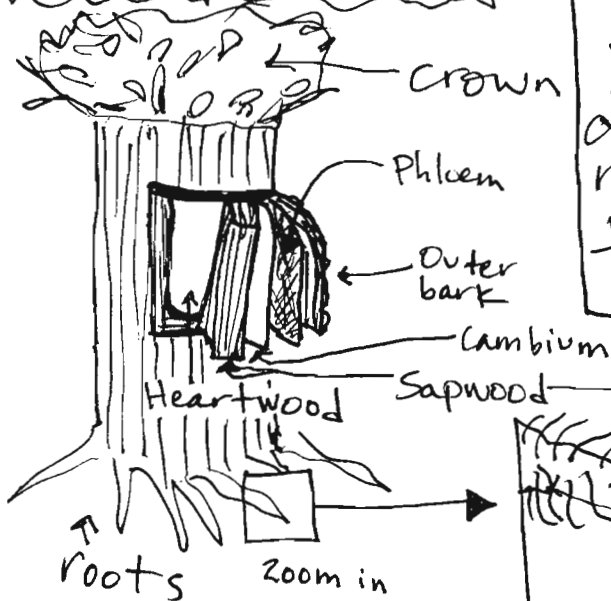
(Say it "Ah-nold")

Equipment:

- HOLY POOP! Lots of water! This is a long walking trip
- Big lunch
- Boots
- Field kit
- Extra \$ if you want to get something at the farmstand near the arboretum

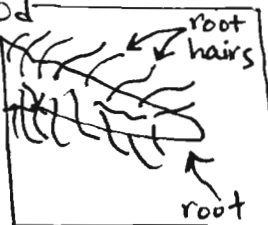
HEY! ARBORETUMS HAVE TREES! SO CHECK THIS OUT:

Anatomy of a Tree



Phew! Today you'll be giving your legs a workout, and eventually you'll chill among the trees at the arboretum. This is the last regular walking trip of Envi-Sci, which means you guys are already pretty well-prepared for the mountain sequence. You are all strong! Fearless! Yes! So today's trip will show you how well-prepared you are - you can do this trip no problem, after all the training we've done together!

Hey Smarties! Any idea why root hairs might help a tree get more nutrients from the soil? Eh? Eh?







TRIP SLIP # 12

7/10/19

ARNOLD ARBORETUM



YOU NEED:

Day Pack 
lots o water 
Lunch
Hiking Boots 
Rain Gear 

MEET AT: Brown
Times: 9-4

David Krinsky
(617) 332-4459

Lyuda Kovalchuk
(617) 584-2624

What is a arboretum?
A) is a place where
trees can be cared for.

At the Arnold Arboretum
there is a whole hundreds
of trees everywhere.

My absolute favorite
positively favorite thing at the Arnold
Arboretum is a

BONZI Tree

In case of emergency, your child will be brought to:
Newton Wellesley Hospital: 617-243-6000.

This program must comply with the regulations of the Massachusetts Dept. of
Public Health and must be licensed by the city of Newton Health Department.

Arnold Arboretum



Trip slip # 12
7/19/05

Leaders:

Lyuda Kovalchuk
617-584-2624

David "Q" Krinsky
617-332-4459

Meet @: Brown When: 9-4

Equipment: boots, 2 pairs of socks, tons of H₂O,
big lunch, rain gear, field kit

Arnold Arboretum is a 268-acre expanse of trees and shrubs that's been around since 1872! It's a really cool place to visit because of the variety of organisms ^{that} can be found there... there are even some bonzai trees! It's a pretty long walk, so be sure to bring lots of water!

? Question: What is the difference between a tree and a shrub ???

Answer: In order to be a tree, a plant must be at least 13-20 ft tall, have a woody stem, and be able to stand on its own.

Trivia: What famous university takes care of the Arboretum?

In case of Emergency, your child will be brought to:
Newton Wellesley Hospital: 617-243-6000.

This program must comply with the regulations of the Massachusetts Dept. of Public Health and must be licensed by the City of Newton Health Department.

ARNOLD ARBORETUM.

Tripslip number: Fourteen (14)

Date: Tuesday, July Twenty-fourth, 2001 (7/24/01)

Time(s): Eight-Thirty until Four (8:30am-4pm)

Meeting Location: Brown Middle School, in Newton

Leader(s): Jonathan Rivnay (617-527-1849)

Required Equipment: Hiking Boots (with 2 pairs of socks), lots of Water, big Lunch, Field Kit (Raingear, First Aid, etc.), Bring money (\$\$) if you want to buy something at the market on the way back.

Tripslip Contents: "Arboretum." "Arnold." "Trees."

TREES.

The tree is not an immutable biological category but rather a human concept based on visual criteria. Perhaps a general definition would describe a tree as a perennial woody plant that develops along a single main trunk to a height of at least 4.5 meters (15 feet) at maturity. This can be contrasted with a shrub, which might be loosely defined as a woody plant with multiple stems that is, in most cases, less than 3 meters tall.

ARNOLD.

today we will be going to the arnold arboretum. the arnold arboretum is a research and educational institution of harvard university. it manages a collection of hardy trees, shrubs, and vines located on 265 acres in boston the grounds were planned and designed by the arboretum's first director, charles sprague sargent, in collaboration with the landscape architect, frederick law olmsted as part of boston's emerald necklace park system. founded in 1872 and named for its benefactor james arnold, the arboretum continues to collect woody plants from around the world and now contains approximately 1,307,084 specimens, including those of cultivated origin. [p.s. on the way back we may stop to buy something at the farm...so you may want to bring money.]

ARBORETUM.

An **arboretum** is a place in which a collection of rare trees and shrubs is cultivated for scientific or educational purposes.

Weather Forecast (by boston.com):

EnviSci takes no responsibility for the accuracy of the boston.com weather forecast. You must bring your raingear and lots of water, no matter what!

**Tuesday,
July 24, 2001**



t-storms:
H89 / L74

Hazy sunshine, hot, and humid. Breezy. Chance of thunderstorms late in the day or Tuesday night. Thunderstorms may be locally strong-to-severe. Highs 85 to 90. Lows 70 to 75.



015 - Pin Oak



016 - White Oak

ARNOLD ARBORETUM

LEADER: ANGELA (617) 527-7993

TIME: 8:30-4

LOCATION: BROWN MIDDLE SCHOOL

EQUIPMENT: FIELD KIT, LOTS OF WATER, BIG OL' LUNCH.

BOOTS, ~~AND~~ AND POSSIBLY SOME EXTRA MONEY

BECAUSE THERE IS A GREAT FARMER'S MARKET WE PASS ON THE WAY BACK. 2 pairs of socks

ARNOLD ARBORETUM IS A 256 ACRE PARK FILLED WITH TONS OF DIFFERENT TYPES

OF COOL TREES. IT IS RUN BY HARVARD UNIVERSITY. AND IT IS OPEN TO THE PUBLIC FOR FREE. WE GET TO SEE ALL TYPES, INCLUDING LITTLE BONSAI TREES. I KNOW Y'ALL ALREADY LEARNED ABOUT TREES, NOW WE'LL LOOK AROUND AND LEARN SOME MORE.

CAN YOU ALL IDENTIFY THE FOLLOWING PARTS OF A TREE?

CROWN -

XYLEM -

PHLOEM -

CAMBIUM -

CORK -

THIS IS ALL THE LEADERS FAVORITE TRIP - SO LET'S HAVE FUN!

-HOW TALL IS THE TALLEST TREE?

-HOW DO YOU TELL HOW OLD A TREE IS AND WHAT IT MAKES OF?

-HOW DOES A TREE GET FOOD WATER?

-WHAT DELICIOUS TREE IS EATEN BY NEVER USE OR ALL ITS LEAVES?

-HOW DOES A TREE SUPPORT ITSELF?

-HOW DOES A TREE GET FOOD?

-HOW DOES A TREE GET WATER?

-HOW DOES A TREE GET NUTRIENTS?

-HOW DOES A TREE GET SUNLIGHT?

-HOW DOES A TREE GET AIR?

-HOW DOES A TREE GET SOIL?

-HOW DOES A TREE GET RAIN?

-HOW DOES A TREE GET WIND?

-HOW DOES A TREE GET SNOW?

-HOW DOES A TREE GET ICE?

-HOW DOES A TREE GET FOG?

-HOW DOES A TREE GET CLOUDS?

-HOW DOES A TREE GET MOON?

-HOW DOES A TREE GET STARS?

-HOW DOES A TREE GET PLANETS?

-HOW DOES A TREE GET GALAXIES?

-HOW DOES A TREE GET THE UNIVERSE?

ARNOLD

TRIPSLIP #11

ARBORETUM

The Arnold Arboretum is a 256 acre park filled with spiffy trees. There are all types of trees, local and exotic. The arboretum is run by Harvard University, which is very nice of them because they let us use their park and see all these great trees for free. My favorite part are the bonsais, they are SOOO COOL!

Leaders:

Amelia (244-9882)

Sarina "Bean"

Yospin (969-3966)

Time: 9-3pm

meet @ Brown

Equipment:

Field kit,

boots, much

WATER,

yummy big

lunch, \$ for

fruit if you

want some

↓

pinately compound

↓

simple

↓

palmately compound

↓

palmately compound

Things to think about:

- What makes a tree?
- What are the parts of a leaf?
- What is transpiration
- Why did I call Sarina "Bean"?

Well, this is our last day trip before the mountain sequence starts, so lets have fun and make it a fun trip full of cool trees!

Parts of a tree:

Crown - leafy top

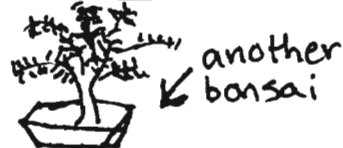
Phloem - carries food up and

down tree

Xylem -

1) Sapwood - carries water

2) Heartwood - supports tree



Cambium - responsible for tree growth

Cork - outer layer, bark

ARNOLD

ARBORETUM

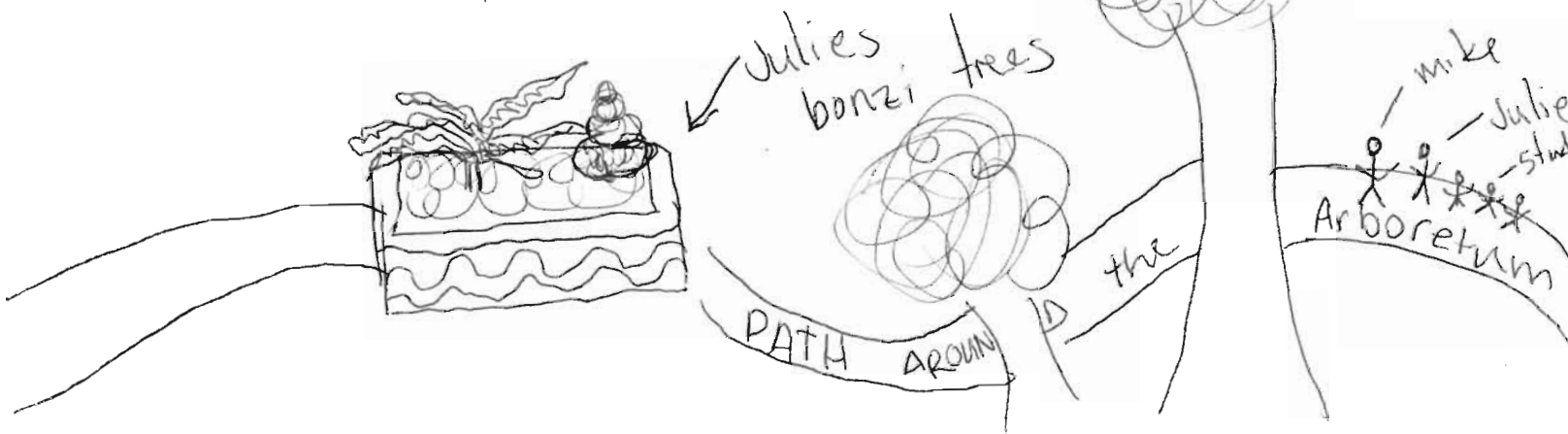
Leaders: Julie 964-7248
Mike 244-0285

Times: 9-3

Meet at BROWN

Equipment: Day pack
a lot of water
lunch
Boots & extra boot laces
rain gear

This has to be my favorite walking trip in the program. Yes, it is a fairly long walk, but the Arboretum is such an interesting place. It is kept-up by Harvard University. What is an Arboretum? An arboretum is a place where trees can be cared for. There are hundreds of different trees in this park. Each tree is also already identified, which makes things easier for us. My favorite part of the trip is seeing the bonzi trees. The little trees are treated like pets. They get groomed and put in to place to make a certian design. These trees are beautiful.



ARNOLD

ARBORETUM

Trip slip # 12

Agatha Cianaly 969-7407

Sarah Northrup 965-4602

July 19, 1994

9:00am - 3:00pm

EQUIPMENT = lunch

lots of water

field kit

notebook/pencil

raincoat

An arboretum is a place where many different species and varieties of trees and shrubs are grown.

Cambium - tree grows in girth from the cambium layer, which produces phloem & xylem

Photosynthesis - sugar and starches are made from water carbon dioxide, and sunlight. Chlorophyll-containing cells in green plants convert incident light to chemical energy and synthesize organic compounds from inorganic compounds.

Sapwood - between cambium and heartwood, carrying sap upward from the roots.

Heartwood - the hard continuing core of a tree trunk, formed of aged sapwood.

What is transpiration?

- the process where water escapes from leaves.

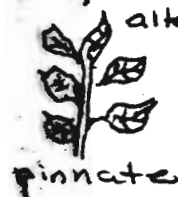
Bark - protects tree's delicate inner tissues from the sun, wind, fire and disease

Phloem - phloem tissue just under bark carries food from leaves through tree

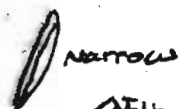
LEAF SHAPES + Parts

Compound alternate

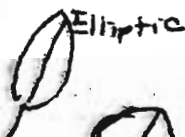
simple



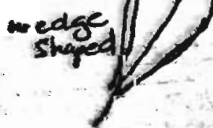
pinnate



narrow



Elliptic



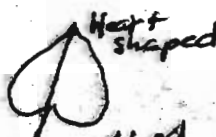
wedge shaped



Lobe

Egg Shaped

Palmate



Heart shaped



Long pointed



Fan veined

parallel

What is the difference between a tree and a shrub? A tree has to be 13-20 feet tall. A tree has to have a woody stem. The trunk of the tree has to be 3 to 4 inches or larger in diameter. Trees have to be able to stand by themselves.

What is the difference between dwarf and dwarfed tree? Why would this affect how we tell if the trees on Mount Washington are trees or shrubs.

Well anyway today is a very long hike so get a good night's rest so that you will be prepared.

Trip #11

ARNOLD



(Get it? Like the buff guy?)

This is a LONG walking trip, so be sure to wear 2 pairs of socks!!

(Get it? Like the trees?)

sniffle - this is your last ESP 2000 regular trip pre-Mt. sequence!

Leaders: Sarina Yospin (969-3966)
Amelia "Funyan" Runyan (244-8836)

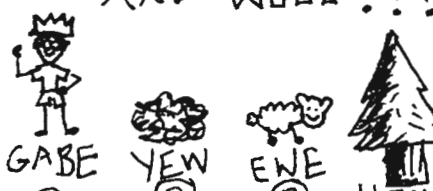
Date: July 19, 2000 Times: 9-3 Meet at: Brown

Equipment: Field Kit, boots, 2 (two) (M) pairs of socks

LOADS of water, big lunch (extra contributions for your leaders are not required but are strongly encouraged), map + compass, this trip slip, a couple extra \$bucks \$ for fruit, if you want

Arnold Arboretum is a 265-acre public, but you are lucky to do this? I would be happy as a clam (a very local and exotic! It is a happy clam) if we could ID some trees there. What factors should be taken care of by Hahvahd University and shrubs, both been since 1872. These trees are maintained for the pleasure of the public, but you are lucky to do this? Leaf shape, bark color + texture, flowers, fruit, tree shape.

Which of the following is officially a tree, AND WHY???



① Gabe ② Yew ③ Ene ④ Hemlock

him a tree? I think NOT! To be a tree, one must...

- ☐ a be at least 13 ft. + tall
- ☐ b have a woody (laugh it up, guys) stem
- ☐ c be at least 3 in. in diameter
- ☐ d stand on one's own

ALL THESE ARE HELPFUL IN IDING TREES! Kids get to learn things! Brain will explode in seconds... keep trying, Gabe!

ARNOLD ARBORETUM

July 19, 1995
Trip slip # 12
Equipment - Boots,
Field kit, lunch,
lots of water,
wear 2 pairs of
socks.

Leaders - Sarah Northrup - 965-4602
Jenny Casavant - 969-2776

TIMES - 9-3

Arnold Arboretum is a fairly cool place to go hangout. We get to go check out the different kinds of trees. We'll see more different kinds there than we'll see just walking around Newton.

What are the qualifications to be a tree?

1. be at least 13ft tall
2. Have a woody stem
3. Have a trunk at least 3-4 inches in diameter
4. be able to stand alone

What is the difference between a deciduous tree and an evergreen?
(think about how a maple looks in the winter compared to how a white pine looks.)

What are the parts of a leaf?

Are trees important?

Do you know what photosynthesis is?

Parts of a tree:

Crown - top of the tree

Cork - outside layer, used for protection

Phloem - carries food up and down the tree

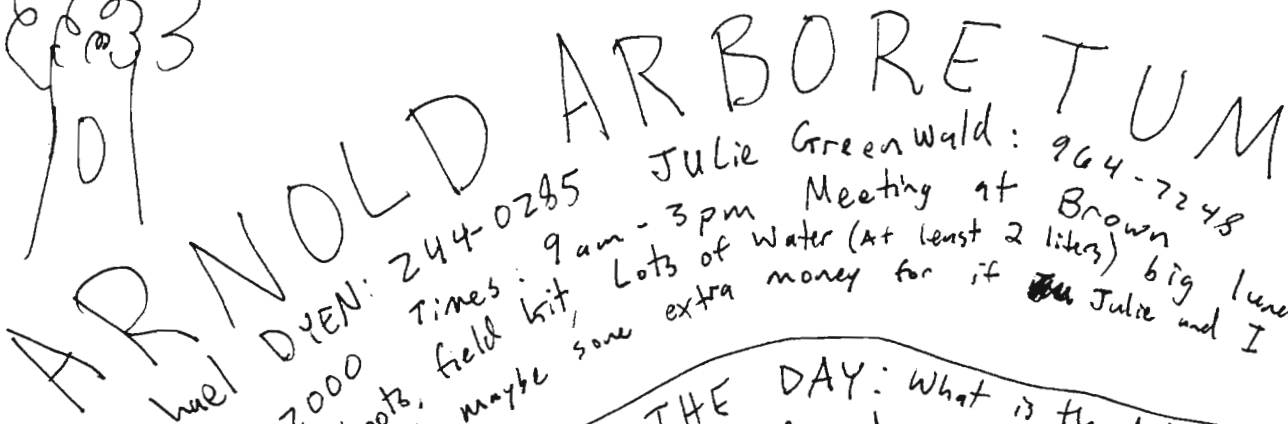
Cambium - makes new wood

Xylem - (2 parts) sapwood - carries water up
Heartwood - supports the tree

leaves - absorb water
carry out photosynthesis

roots - carry minerals and water into the tree

root hairs - Increase the surface area of the roots to help absorb water and minerals.



R NOLD H K M
 Michael DYEN: 244-0285 JULIE Greenwald: 964-7248
 July 18, 2000 Times: 9am - 3pm Meeting at Brown
 Equipment: boots, field kit, Lots of water (at least 2 liters) big lunch
 sun block, and maybe some extra money for it Julie and I feel nice.

FACT FOR THE DAY: What is the difference between
 a shrub and a tree? A shrub has a definitely
 formed crown at the center. Usually
 shrubs are quite
 short and I don't know how long. A tree has a
 single trunk and I don't know how long. A tree has a
 single trunk and I don't know how long.

2000
 ent: boots, tie
 black, and maybe

FUN FACT FOR THE DAY: What is the difference between a tree and a shrub? A shrub is a woody plant at least 3 inches in diameter and away from the center. Usually shrubs are quite small and I don't know how long they live. Some shrubs are quite small and I don't know how long they live. Some shrubs are quite small and I don't know how long they live.

The Arnold Arboretum is operated by Harvard University and was established in 1872. It contains about 265 acres of land, with over 6,000 different species of trees and shrubs. But, all those 6,000+ plants are from the Northern Temperate forest. Now you might be asking, what the Heck is the Northern temperate forest. Well guess what, it is the area in which you live. As you move up and down, North and south, vertically, up and down in earth, the climate changes. In different climate zones, different plants grow. That makes sense doesn't it. What you would expect to grow in Hawaii, you would not expect to grow in Alaska. Anyway, we live in the zone called the Northern Temperate forest. Here is something interesting, there are over 50,000 different species of trees in world and 680 are native to North America. Do you remember how many trees were represented in the Arboretum? What does this mean? Is there tuna fish in between my toes?



TIME: 9 AM - 3 PM

EQUIPMENT: wear 2 pairs of socks in your boots, bring 2 quarts of water, big lunch, \$ for ice cream, & field kit
BRING YOUR TRIPSLIP TOO!

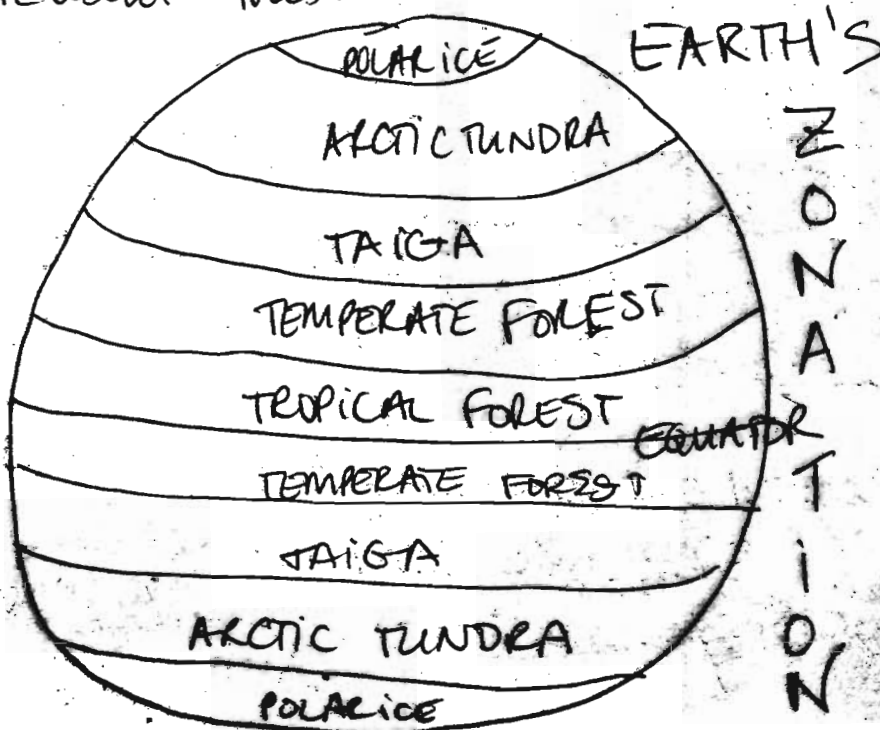
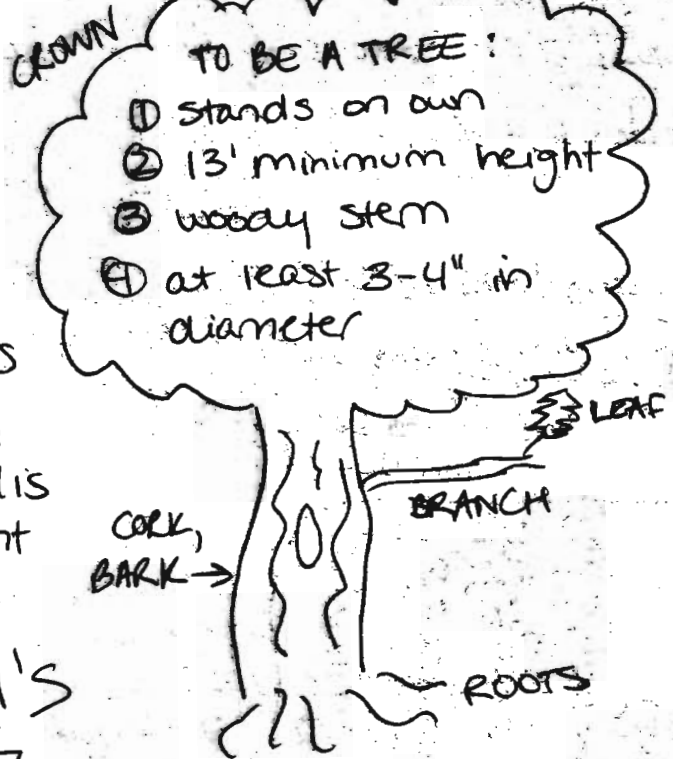
FLEX THOSE MUSCLES!

Pam Manoney (527-5831)
TRIPSLIP # 13
July 20th, 1994

ARNOLD ARBORETUM

(OR "AAHHNOLD AHBORETUM")

The arboretum has been called "America's Greatest Garden." It was established in 1872, and is operated by Harvard University. It is 265 acres of land, with over 6,000 types of trees and shrubs from the North Temperate Zone. What?? The world is divided into zones, which have different temperatures and plants. We'll learn more about this.



FUN FACTS:

- THE TALLEST TREE was 386' high (a redwood)
- THE THICKEST TREE: 30' (a sequoia)
- there are 50,000 species of trees, and only 680 are native to the U.S.

Trip slip #13

July 19, 1993

Members - Gordon
(294-9304)
Kathy - Gay!
(527-3681)

Times 9am - 3:00pm

Equipment - 2 canteens, Crystal H₂O, (vice versa anything)

Lunch, field kit, Icequide - we supply
Hiking boots - 2 pairs of socks

Arnold

Arboretum



Why are trees important to us?

- 1) They provide us with shelter, oxygen and food.
- 2) They help control soil erosion.
- 3) What else can you think of?

ARNOLD ARBORETUM

Today we are going to a tree place -
From here we will see many different types of tree that are taken from all over the world. Here we will see the 2 types of trees, Deciduous and conifers. Do you know the difference. The arboretum is run by Harvard University and is called a living museum!!



Pinnately compound leaf



Palmately compound leaf



Simple leaf



Palmately lobed leaf



Lanceolate leaf



Pyramidal



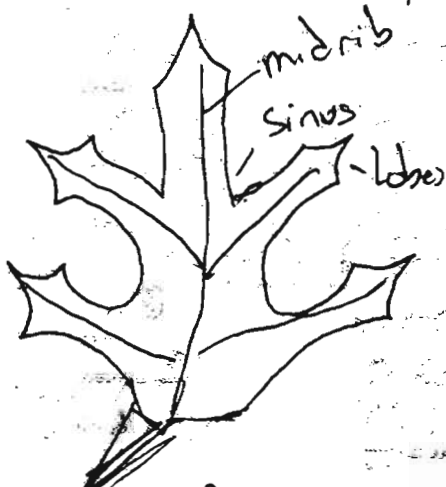
Conical



Columnar

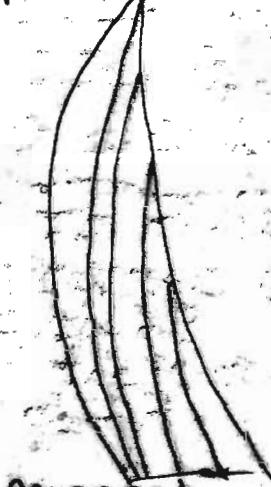
Facts to grow with!

Tallest tree - 368 ft high redwood / Thickest tree - 30 ft in diameter sequoia



Dicot leaf (notice veining)

Parallel veins



Monocot

All land plants

Bryophytes

non-vascular plants w/o veins
Embryophyte

Vascular plants w/ veins
Tracheophyte

with seeds

w/o seeds (ferns)

Angiosperms
(flower + fruit bearing plants or trees)

Gymnosperms
cone bearing trees or plants

monocots

dicots

tripslip # 10

July 15, 1991

leaders:

Beth Ann (332-2827)

+ Anna

Time 9AM - 3PM

Destination: Arnold Arboretum

Equipment

Field Kit

Boots

Money (maybe \$3)

An extra canteen of good hiking energy liquid

Did you know?

If the U.S. recycled just half of the newsprint consumed each year, it would divert almost six million tons of paper from landfills! So Recycle, Recycle

Remember:

1. to bring an extra canteen filled with ice tea or lemonade for example, this helps our sugar levels to stay up.

2. to bring money

ARNOLD ARBORETUM

This is going to be a long hike but it will get you in shape for the mountains! Remember it will be 9 to 3 not 9 to 2, we need that extra hour. Once we get to the Arboretum we will have lunch and then look at the cultivated exotic and indigenous trees and shrubs! Also don't forget money, we could stop at an ice cream store on the way back if you guys are good!

Things to think about:

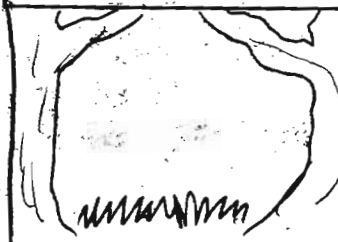
How are plants classified?
What does Arboretum mean?
What are some uses of trees?
Why is it good to have a place like this in our community?

because we might stop for ice cream on the way home.

3. and rested feet because this is going to be a long hike!

Objectives:

① take a long walk to get in shape for the mountains.
② learn about trees, their place in nature, and man's interaction with these most dominant of land plants.



ARNOLD
ARBORETUM

Tr 4 slip #12

(969 - 7407) Agatha Clancy
(532 - 8932) Rachel Kuller

July 16, 1993

Time 9:00 - 3:00

equipment: 2 canteens boots
lunch
field kit 5

equipment: 2 canteens boots
lunch
field kit

what are
two major categories
of trees. These are Deciduous
and conifers. Deciduous
Deciduous - loses its leaves in the
fall and bare branches in
the winter.

Conifer - A cone bearing tree which has
needles on the branches instead of leaves.
It has needles all year long.

important to the environment. They are good
us cool but this is not the only reason it's
ough a process of transpiration. A tree
ing. These droplets of water fall to the ground
air. It's the water that falls to the ground
very important process. This
to synthesis is the intake of
oxygen. This is very good why?
must be at least
makes in diameter
cone bearing.

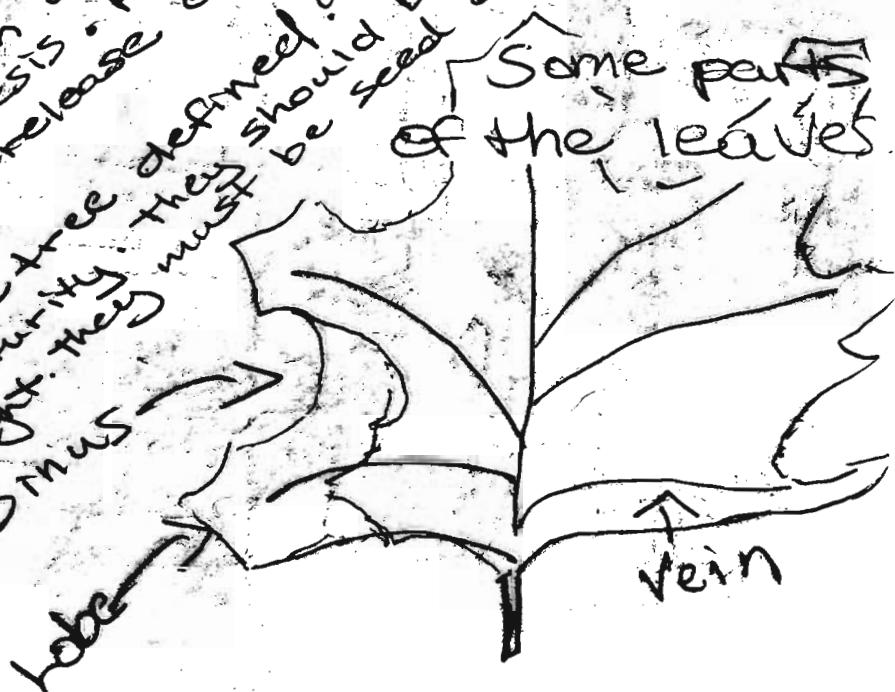

what are
two major categories of trees. These are Deciduous and conifers. These are Deciduous - loses its leaves fall and bare branches the winter.

Conifer - A cone bearing tree which it has needles on the branches instead of leaves all year long.

Why are trees important to the environment. The most important process is photosynthesis. This is the process by which plants use sunlight and carbon dioxide to produce glucose and oxygen. This process is very important because it provides the oxygen that we need to breathe. Without photosynthesis, life on Earth would not be possible.

How is a tree defined? They should be at least 13 ft. tall at maturity. They must be at least 5 inches in diameter at chest height. They must be seed or cone bearing.

Some parts of the leaves



Arnold Arboretum

Leaders: Leca Thomas 527-2763
Gail Stanton 964-5857

Equipment: hiking boots, field kit

Times: 9am - 3pm

DATE - JULY 17TH, WEDNESDAY, 1990

LUNCH \rightarrow H₂O

bring at least 2
canteens it is
going to be ~~so~~ HOT

TAKE A WILD GUESS AND GUESS WHAT WE
ARE GOING TO SEE!

THAT'S RIGHT! **TREES**

first off, let's do a little classification!

BRYOPHYTES
(ALL LAND PLANTS)

non-vascular
(plant without
veins)

EMBRYOPHYTE
[mosses + Liver worts]

vascular
(plant with veins)
TRACHEOPHYTE

LEAVES
veining



see below
for more
info on
Monocots
& Dicots

with seeds

without seeds
(FERNS)

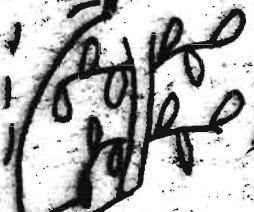
ANGIOSPERMS
(flower + fruit
bearing trees
or plants)

GYMNASPERMS
(cone bearing
trees or
plants)

compound leaves



opposite
compound leaf



alternate
compound leaf

monocots
(parallel
veins)

dicots
(branching
veins)

these are one leaf
each
this is a leaflet.



TIME \Rightarrow 9:00^{am} - 3:00^{pm}

LEADERS \Rightarrow Me + Dan (244-5023)

Molly Smith (965-1979)
TRIPSLIP #10
July 16th, 1992

ARNOLD ARBORETUM

Equipment: Boots (w/ 2 pairs of socks), LUNCH, WATER, field kit,
\$ for Ice Cream.

The Arnold Arboretum is a living museum that is operated by Harvard University. There are not only common varieties of trees, but more unusual ones too. We'll even get to see a bonzai garden.

What are BONZAI TREES? They are miniature Japanese trees that have been specially pruned to keep them small.

FOREST FACTS:

Tallest Tree - 368 ft. high (Redwood)

Thickest Tree - 30 ft. (sequoia)

* There are 50,000 different species of trees, only 680 are native to the U.S.

WHAT DEFINES A TREE?

* At least 13 ft. tall at maturity.

* 2-inches in diameter at chest height.

* must be seed bearing, but some have cones.

DO YOU KNOW?

* How trees transport food and water?

* What the different types of leaves are?

What is the midrib of a leaf?

Compound

PALMATE

PINNATE

WHY ARE TREES IMPORTANT TO US:

- 1) They provide us with: shelter, oxygen and food.
- 2) They help control soil erosion.
- 3) They can be used for paper + timber

Here are some common shapes of trees:



PYRAMIDAL



CONICAL



COLUMNAR



TRIP #12

July 19, 1989

EATER WITHOUT COOTIES

Coke Stanton (964-5857)

7-3pm

EQUIPMENT

Field Kit & Boots

Rested Feet

Tree Love

Some \$ (about 3)

An extra canteen

of good hiking

energy liquid

like iced tea or lemonade.

ARNOLD ARBORETUM



Operated by Harvard University, who also jointly administers the arboretum as a City of Boston park, Arnold Arboretum, (despite clumsily constructed run-on sentences) is a wide expanse of hundreds of cultivated ~~and~~ exotic and indigenous trees and shrubs.

Collected from all over the world (including a Bonsai garden and Libe grove of fame) Arnold Arboretum is easily one of the largest and best landscaped of arboretums.

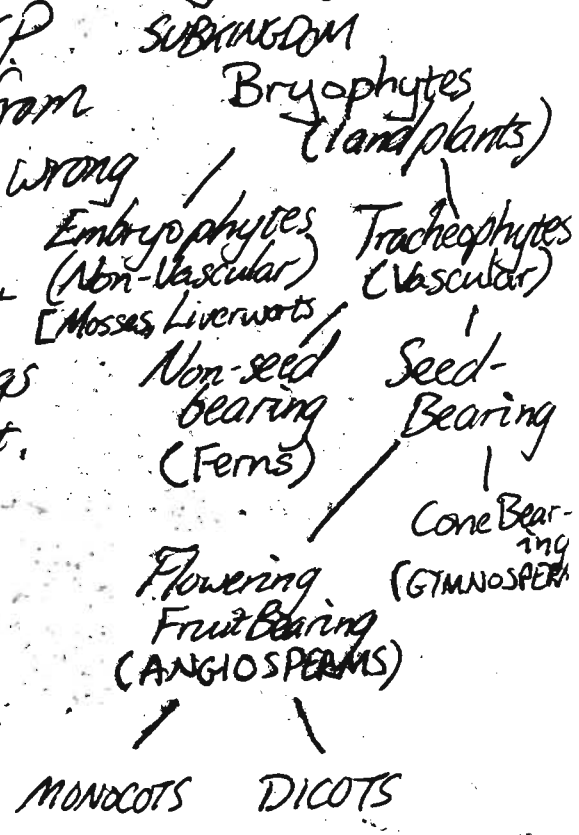
OBJECTIVES:

- 1) Take a long walk for some GREAT exercise
- 2) Learn about trees, their place in nature, and man's interaction with these most dominant of land plants.

QUESTIONS:

- 1) What is Silviculture?
Dendrology?
Dendrochronology?
- 2) What is Forest Succession
And what are its stages
- 3) What are cambium, xylem, phloem, heartwood, stomata, and chlorophyll?
AND MANY MORE?

Today we will learn HOW WE a great deal about trees CLASSIFY LAND and shrubs. This is woody PLANTS plant day for ESP. So to keep you from barking up the wrong tree. On the left and right are some things to think about.



ARNOLD

Leader: Jeff Wong 332-3617

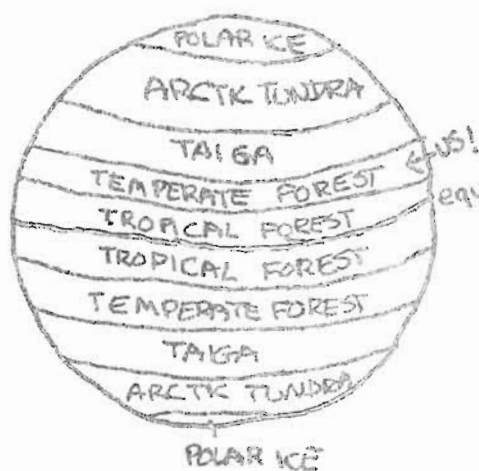
Trip slip #14

Date: July 21, 1997 Times: 9 AM - 3 PM Meeting Place: Newton South

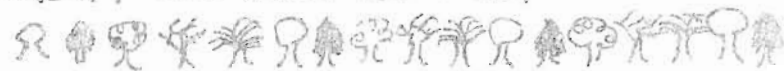
Equipment: boots, 2 quarts of water, field kit, wear 2 pairs, lunch of socks!, sun block, this trip slip, extra \$***optional

↑
2 magic lines

Tomorrow, we'll be walking to the Arnold Arboretum. The Arboretum, operated by Harvard University, was established in 1872. It contains 265 acres of land, with over 6,000 different species of trees and shrubs. However, all these are from the Northern Temperate Forest, a zone of the earth. Here are how the zones are divided up on Earth. What's



the difference between trees, and shrubs? Well, a tree is a woody plant at least 3 inches in diameter and 13 feet tall with a definitely formed crown of foliage. A shrub, on the other hand, is a woody plant with several branches coming out away from the center. Shrubs are usually quite small. They are dwarf, ... or maybe they are dwarfed. What's the difference between a dwarf and dwarfed tree?



Trees are most commonly divided by their reproductive structures. They can be classified as either angiosperms or gymnosperms. Gymnosperms bear seeds on leaves (cones) while angiosperms have seeds enclosed in the ripened ovary of a flower of the tree.

Did you know...

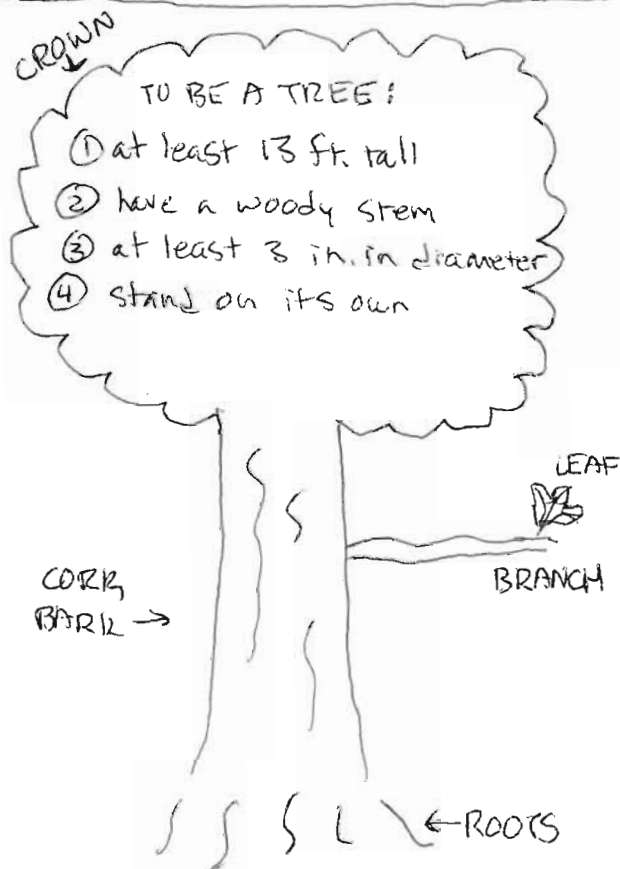
- There are over 50,000 species of trees in the world and only 680 are native to the U.S. and Canada.

- 75,000 trees are used to make just one Sunday edition of the New York Times

- Jeff is very cool

In case you couldn't tell, we're going to Arnold Arboretum

Hmmm... I wonder what trip you're going on tomorrow, could it be the Arnold Arboretum? Yes! This cool place is 265 acres of hundreds, no, thousands of types of different trees and shrubs. Cool, huh? The garden is operated by Harvard University. It was established in 1872.



There are 4 major structural components of a tree

- ① stem - supports tree, pathway for nutrients to move in tree
- ② leaves - absorb CO_2 for use in photosynthesis
- ③ roots - large ones anchor the trees, small ones absorb water and nutrients in soil
- ④ reproductive - male + female parts are either on the same plant or different ones

Leader:

Come along,
sing the Song;
of Jeff Wong,
who beat King Kong

332-3617
or
243-3987

Date: July 15, 1998, Trip #11

Times: 9am - 3pm, Meet @ Brown

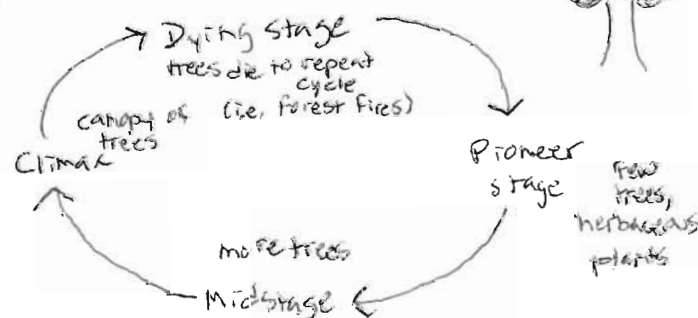
Equipment: field kit, boots, wear 2 pairs of socks, lots and lots of water, sun block, lunch, compass, maps, trip slip, extra money for any snacks we might get (*this is optional*)

→ Remember to wear 2 pairs of socks! ←

What are trees good for anyway?

To us humans, one useful function is the release of oxygen in the air, something we have to have to live. We have arboreums because trees are aesthetically pleasing and provide shade. The trees in the Arnold Arboretum, the trees are from the Northern Temperate zone. The earth is divided into several zones according to distance from the equator. Each zone supports different types of trees because the climate is different in each zone.

You've probably heard a lot about the forest fires in Florida recently. Why are there forest fires and what do they do? Forest fires are all part of forest succession.



Trip Slip # 10

July 15, 1991

Leaders:

Beth Ann (332-2827)

+ Anna

Time 9AM - 3PM

Destination:
Arnold Arboretum

Equipment

Field Kit

Boots

Money (maybe \$3)

An extra canteen
of good hiking
energy liquid

Did you know?

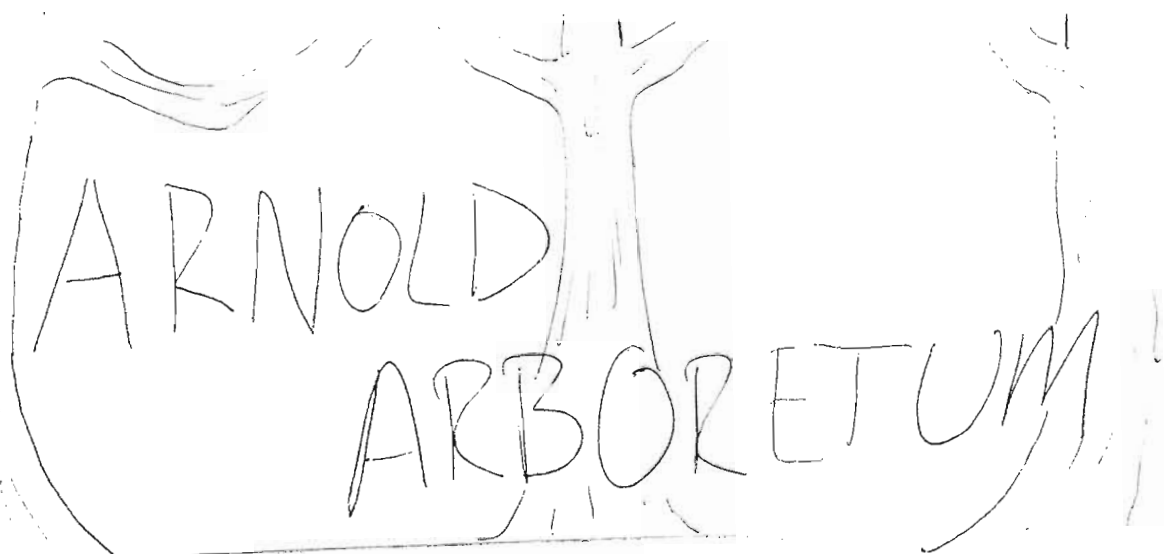
In the U.S.

recycled just half
of the Newsprint consumed
each year, it would divert
almost six million tons
of paper from landfills!
So Recycle, Recycle.

Remember:

1. to bring an extra
canteen filled with
ice tea or lemonade for
example, this helps
your sugar levels to
stay up.

2. to bring money



This is going to be a long hike but it will get you in shape for the mountains! Remember it will be 9 to 3 not 9 to 2, we need that extra hour. Once we get to the Arboretum we will have lunch and then look at the cultivated exotic and indigenous trees and shrubs! Also don't forget money, we could stop at an ice cream store on the way back if you guys are good!

Things to think about:

How are plants classified?
What does Arboretum mean?
What are some uses of trees?
Why is it good to have
a place like this in our
community?

because we might stop
for ice cream on the way
home.

3. and nested feet because this
is going to be a long hike!

Objectives:

① take a long
walk to get in
shape for the
mountains.
② learn about
trees, their place
in nature, and their
interaction with
these most domi-
nant of land plants



Leaders:

Jenny (969-2776)

+
Dan P (964-1313)

Trip slip #14
July 22, 1996

9AM-3PM



ARNOLD

ARBORETUM



Did you
have fun
canoeing?

EQUIPMENT

Boots
Field Kit
BIG Lunch

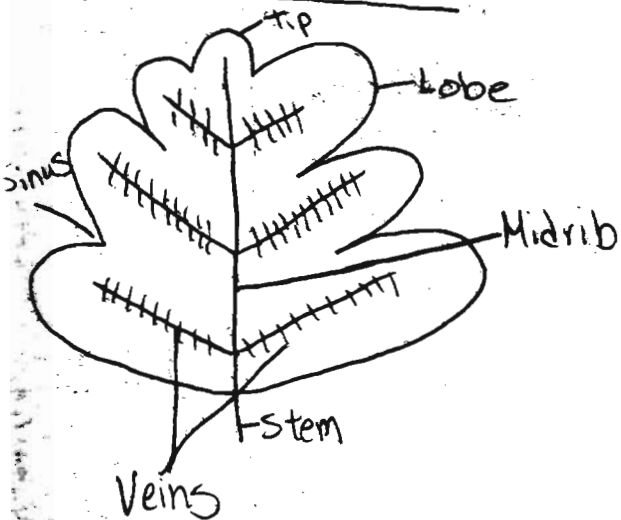
LOTS of WATER
(2 CANTEENS)

\$- We may stop
at the farm
stand if you
guys are good ☺

Basically, Arnold Arboretum is a place with lots of really cool trees that you wouldn't be likely to see growing in someone's backyard (or front yard for that matter). This is a very long trip so be sure to get a good night's sleep beforehand. Since we're

going to be at this great big place that has all these trees, we'll probably be talking a bit about trees (ya think?). Oh my, this is going to be our last day trip within the Newton area! So let's make it an awesome one. Oh geezers, you know what this means... the mountain trips are almost

Parts of A Leaf



(okay, so I'm not much
of an artist).

PARTS OF A TREE

Crown - the leafy top

Phloem - carries food up and down the tree

Xylem (2 parts) -

Sapwood - Carries water up the tree

Heartwood - Supports the tree

Cambium - Responsible for the tree's growth

Cork - Outer layer/Bark, Used for protection

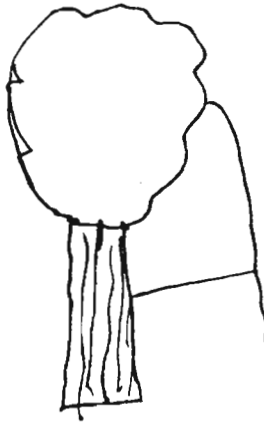
Question: What is Transpiration?

Answer: The process where water
escapes from leaves.

Meet at: EMS

Times: 9-4

Leaders: Sarina Yospin
(969-3966)



Arnold Arboretum

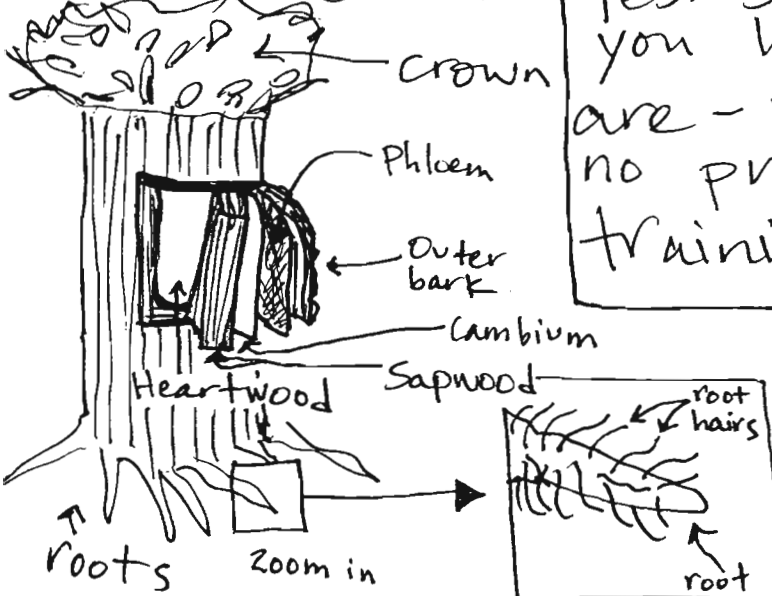
(Say it "Ah-nold")

Equipment:

- HOLY POOP! Lots of water! This is a long walking trip
- Big lunch
- Boots
- Field Kit
- Extra \$ if you want to get something at the farmstand near the arboretum

HEY! ARBORETUMS HAVE TREES! SO CHECK THIS OUT:

Anatomy of a Tree



Phew! Today you'll be giving your legs a workout, and eventually you'll chill among the trees at the arboretum. This is the last regular walking trip of Envi-Sci, which means you guys are already pretty well-prepared for the mountain sequence. You are all strong! Fearless! Yes! So today's trip will show you how well-prepared you are - you can do this trip no problem, after all the training we've done together.

Hey Smarties! Any idea why root hairs might help a tree get more nutrients from the soil? Eh? Eh?

Trip slip #14
Date: 7-20-98
Place: Brown
Times: 9-3

Leaders: Gabe Yaspin 969-3966
Angela Simunovic 527-7993

Stuff: Field kit 3 day pack, extra water, a crazy big lunch, the biggest tufted fruit you can find, some extra benjamins (\$) for fruit.

Arnold Arboretum

Charlie

Yippity skippity!

TREES!

That's right, today we're walking to the arboretum to visit

some of my favorite trees. Although there are over 360 species of trees that grow naturally around these parts, there are thousands more that don't. That's why the arboretum is so cool; all these species that don't grow very well here are maintained at the arboretum. It's like a big zoo, with trees. Because all the trees are labeled, this is a perfect time to do some tree ID's. Here's how to do it:

Leaves

Some possible shapes are: serrated, simple, compound, linear, lanceolate, oblanceolate. Yes, there are about a dozen more. Also look for how they're joined to the stem.

Bark

Lots of people disregard the bark of a tree, but like a fingerprint, bark can easily distinguish between species. Carefully check color, texture, and other such traits.

Flowers

Look for color first, then shape, size, # o' petals, shape of petals, shape of sepal, arrangement o' flowers, lengths of stem. Flowers have many differences, and can be easily distinguished.

Fruit

Too many types to list them all. I'll show you pictures tomorrow.

Tree Shape

Pyramidal, Conical, Column, Spreading, Vase, Broad, Rounded. People often think that they need to get way up close to ID a tree, when often shape can be very helpful.



Trip slip #10 _____ Arnold (Arnie) Arboretum _____ July 17, 1992

Leaders: Daniel Ordorica (244-5023)

& Molly Smith (965-1979)

Time: 9am-~~2~~₃pm

Equipment: Field Kit, Boots, Lunch

Arnold Arboretum is a 350 acre reservation of trees. Trees from this area and exotic trees. Does anybody know what "arboretum" means (HINT: Arbor means "tree" in latin).



Question- What makes a tree, a tree? (1/2 the answer- it must have a trunk with diameter of at least 3.5 inches)

The three main features of a tree is the Head(the leafy part), the Body(the trunk), and the roots(the roots). The Head can come in a number of styles(a bit like hair), these shapes are

- 1) pyramidal, 2) Conical, 3) Columnar, 4) Spreading,
- 5) Vase-shaped, 6) Broad, 7) Rounded



July 19, 1988

AKNOLD ARBORETUM

LEADER WITHOUT COOTIES

9-3pm

EQUIPMENT

Field Kit & Boots
 Rested Feet
 Tree Love
 Some \$ (about 3)
 An extra capteen
 of good hiking
 energy liquid
 like ice, tea or lemonade.

Operated by Harvard University, who jointly administers the arboretum as a City of Boston park, Arnold Arboretum, (despite clumsily constructed run-on sentences) is a wide expanse of hundreds of cultivated exotic and indigenous trees and shrubs.

Collected from all over the world (including a Bonsai garden and like grove of farne) Arnold Arboretum is easily one of the largest and best landscaped of arboreums.

OBJECTIVES:

- 1) Take a long walk for some GREAT exercise
- 2) Learn about trees, their place in nature, and man's interaction with these most dominant of land plants.

QUESTIONS:

What is Silviculture?
 Dendrology?
 Dendrochronology?
 What is Forest Succession?
 And what are its stages?
 What are common forest types?
 Oak, pine, hemlock, spruce, fir, etc.

Today we will learn HOW WE
 a good deal about trees CLASSIFY LAND
 and things. This is woody PLANTS
 plant life. EST. SUBSTRATUM
 So you know from Bryophytes
 bar Rins? wrong? (mosses)
 trees. Eucalyptus
 for one thing. Eucalyptus
 to the point.

Arnold Arboretum

Leaders: Angela Simunovic (527-7993)

July 20, '98 Tripslip #11

Jesse Sayles ()

Time: 9-3 at Brown

Equipment: Field Kit, Boots, day pack, LOTS OF WATER, a big lunch, and wear two pairs of socks!

Today we are going to take a long trip to the Arnold Arboretum. Arnold Arboretum was named after a man named James Arnold who was its benefactor. It is a research and educational institution covering 265 acres in Jamaica Plains. Today we will walk through out the arboretum and look at the 5,000 kinds of woody plants from across the globe. The trees, shrubs, and vines are grouped together by family and are arranged in a botanical sequence along the main drive. Hopefully, and more than likely, we will be able to see all sorts of different plants we have never seen before.

Syringa
vulgarum
Persia

#456

On all of the trees and plants we see there there should be a tag like this. This tag tells us the common name for the plant, in this case Syringa (a type of lilac).

It tells the scientific or Latin name and the country of origin. The tag should also include an I.D. number. That number corresponds to a computer database that could tell us all sorts of different information about the particular plant, like its background, or what it is used for.

We won't have time to explore all 265 acres, but you'll still see some pretty interesting trees. You may even be able to identify some of them. Won't that be a blast. This is the second to last tripslip before the mountain sequence. It is going to be a lot of fun and it is one of the last chances we will have to walk along the paved streets of Newton (and surrounding cities) as the 1998 Environmental Science Program. Isn't that sad? I don't know about you but for me this month just flew by. So bring everything, especially water, because if it is as hot as it was last (this) week you'll need it and you don't want to run out.

ENVIRONMENTAL SCIENCE PROGRAM

1

9

9

6

Trip Slip #14

July 22, 1996

9am to 3pm

Meet at:

Newton South

Your Leaders

Dan P.
964-1313
Jenny Casavant
969-2776

Equipment List

- Field Kit
- A large lunch
- Lots of water (*at least* 2qts)
(*Optional:* a sugary drink for that quick burst of energy)
- 2 pairs of socks (to reduce friction and prevent blisters)
- Boots
- Shorts (or weather appropriate clothing)
- **OPTIONAL:**
 - \$\$\$ for Ice Cream or the farmstand that we will stop at on the way *back*

Remember...

**IF YOU ARE GETTING
BLISTERS, LET ONE OF US
KNOW! WE CAN HELP!**

Arnold Arboretum

(pronounced "Aahhbnold Aboretum")

What is Arnold Aboretum?

Arnold Arboretum is a fairly cool place to go hangout, have fun, and play hug-a-tree! It has been called "America's Greatest Garden." Established in 1872, it is currently owned and operated by Harvard University. It is made up of 265 acres of land, containing over 6,000 different types of trees and shrubs from the North Temperate Zone.

What is the North Temperate Zone?

The earth is divided up into many different zones. Each zone has a unique temperature and weather pattern, and with this comes varying species of trees, plants, and animals.

Are you a tree?

What does it take to be a tree? Quite a bit more than you may think! To be a tree:

- 1 It must stand on its own
- 2 It must have a diameter of at least 3 to 4 inches
- 3 It must have a woody stem
- 4 It must have a minimum height of 13 feet

Since there are so many trees there, we'll probably play hug-a-tree! Admit it, you know it is your favorite game. You will use your various senses (other than sight!) to identify different trees.

Things to think about...

The **tallest** tree was a 386 foot high redwood.

The **thickest** tree was a 30 foot thick sequoia.

There are 50,000 species of trees, and only 680 are native in the United States.

Do you know the different parts of a tree?



Trip #11
7/18/95

ARBORETUM

Leaders - Gordon Noble - 244-9384
Location - Brown Sr. High
Times - 9:00 am - 3:00 pm

Equipment - lunch boxes, H₂O (bottles)
Swing gear and field kits 2 pairs
of shoes

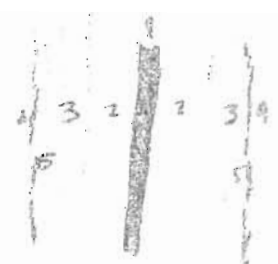
Today we are going to what has been called the greatest garden in America. It is filled with trees from all over the world, including some amazing bonsai trees. So one thing that is very important is that we know how to tell the difference between a tree and a shrub.

A tree

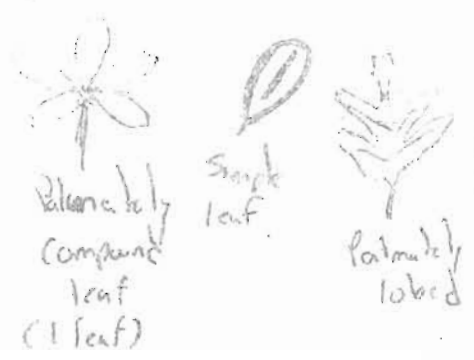
- At maturity at least 13 feet high.
- woody stem w/ cork protecting it.
- Trunk at least 3 inch in diameter
- must be able to stand by itself.

While we are at the arboretum we will also learn how a plant / tree goes about making its food, and then how it distributes it through-out the rest of the tree. We will also learn why this process is important to the rest of the world. Besides this process which, incidentally gives us Oxygen, we will see why a tree is important in maintaining the general strength of the ground with its roots.

This is a tree

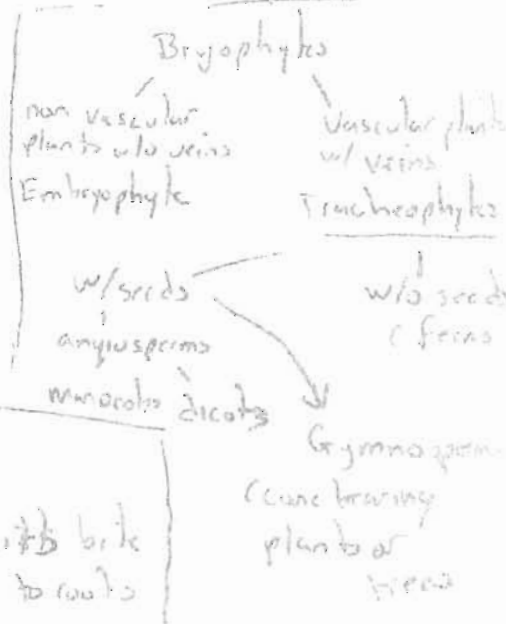


1. Heartwood - aged sapwood which provides tree with a core
2. Sapwood - the living part of the tree - how sap in it

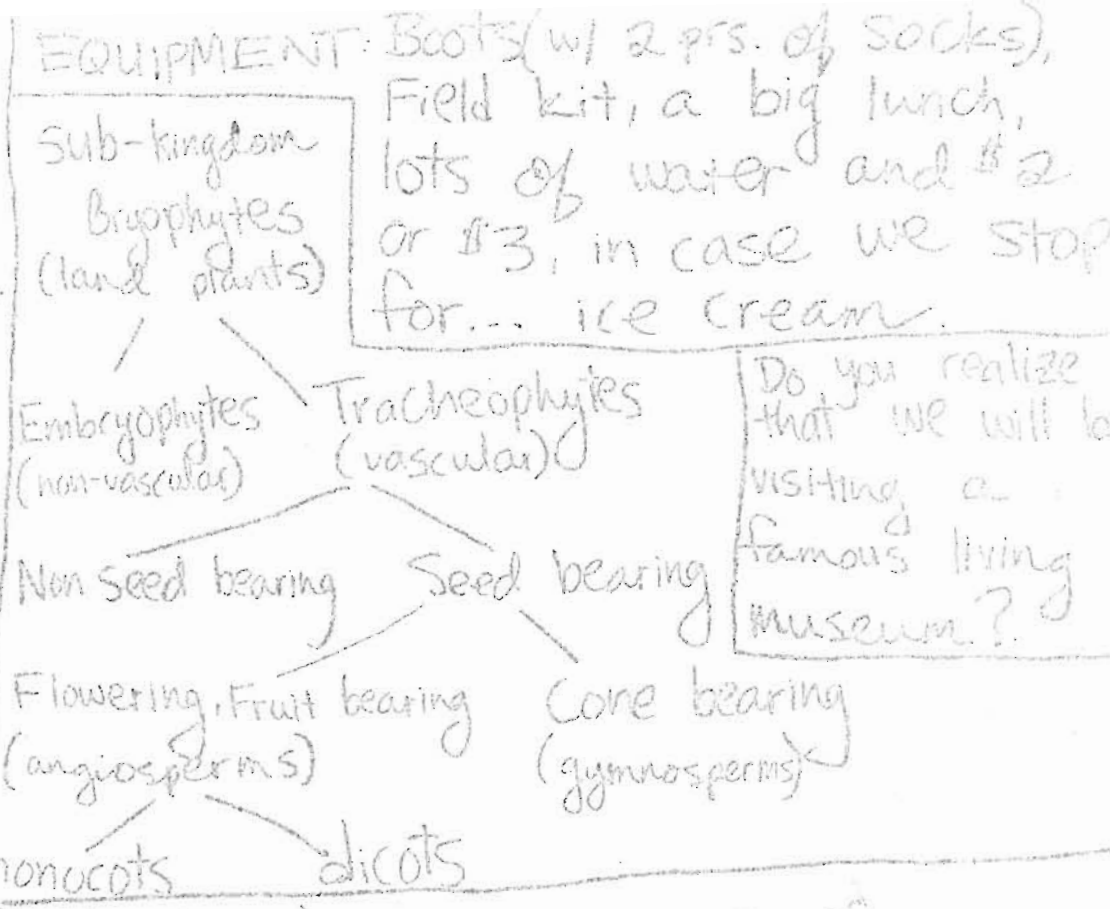


3. Cambium - area in which the tree grows wider
4. The bark is worse than its bite
5. Phloem - carries food to roots

land plants



TRIP SLIP #F10
 Date: July 15, 1991
 Times: 4 AM - 3 PM
 Place: from Newton
 South to
 the Arnold
 Arboretum
 and back
 Leaders:
 ANNA DOHERTY
 (965-3815)
 Beth Ann



Do you realize that we will be visiting a famous living museum?

Some good words to know:
 Dendrology - the study of trees
 Silviculture - man's use of trees
 Xylem, phloem, cambium, erosion... what do they mean?
 heartwood, midrib, sapwood, pinnate
 too many words

What is a tree? By definition, a tree is "a plant over 13 feet tall at maturity with a 2" diameter trunk with bark at chest level. All are seed bearing, although some have cones."

This is going to be our first extra long hike. Please note the times, and don't forget your water, food, water, food, water.

1 Trip/Ship #11

Date: 7/21/76

Time: 9:00

Place: Arnold Arboretum.

Leader: Lee 969-4334

Equipment:

Full field pack:

(and I mean full.)

Thermometer

vials

Lunch

Canteen with water

Hiking boots

Rain gear

Group equipment:

Flowering plant book

Non-flowering plants

Trees

Pond life

"D.O." kit

I am trusting you to pick up this group equipment and if you don't I will be extremely mad.

Grist for the Mill:

note: If you don't know what your mill is disregard this section.

1. How many tons of paper products do you use in a year?
2. Are our national forests a renewable resource?
3. Could our society function without so many paper products?
4. By using these paper products are you supporting the blatant destruction of our forests?
5. How come these trees can survive in the Arboretum and not in the streets of Newton?

Observations

Just by looking at outward appearances can you tell what climate the tree naturally occurs in?

If these trees are not carefully screened before entrance to this museum is allowed what is the danger to indigenous trees?

List 10 ways to differentiate one tree from another.

1. _____
2. _____
3. _____
4. _____
5. _____

2

Objectives

- a. To complete a fairly long hike
- b. To practice some water conservation.
- c. To continue to improve our map skills.
- d. To observe some rare & Non native trees.
We will also discuss many thousands of uses of the tree.
- e. To learn some team work and Tolerance of others.
This will be a joint trip with Ericas group.

Hiking tips

- a. Wear two pairs of socks.
This will not only protect your feet from chafing but will also help to draw moisture away from your feet if you wear a thin pair of socks on the inside.
- b. Try to retain a walking rhythm by not stopping when you really don't have to.
- c. Try to use little or no water before lunch unless it is an extremely hot day.
- d. Keep your pack weight down to a minimum, if you are told not to bring your rockhammer don't

page 6

6. _____
7. _____
8. _____
9. _____
10. _____

ARNOLD ARBORETUM

Views of trees from the Centuries

Every tree that bringeth not forth good fruit is hewn down and cast into the fire. - Jesus

The tree does not withdraw its shade, even from the woodcut.
- Hippocrates - ~~hippocrates~~

The tree of Brasil, which reaches up to heaven, ~~and~~ goes down to the kingdom of hell; and God, the Everlasting good and just in it all. - Carlyle

The tree of liberty only grows when it is watered by the blood of tyrants. - Bertrand Barere

The tree of silence bears the fruit of peace - Arabic Proverb.

The tree of knowledge is not that of life - Byron

Unless a tree has borne blossoms in spring, you will look vainly for fruit on it in autumn - Hare.

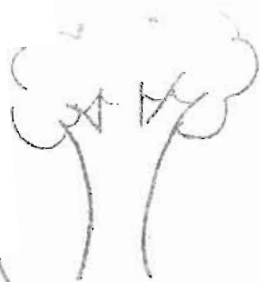
Care is taken that trees do not grow into the sky - Goethe

A tree grows in Brooklyn - Betty Smith

I like em - Lassie, Snoopy, Rin Tin Tin, et al.,

What are those things people think you are mad if you talk too? Like George the Third? Trees! I practice by talking to trees - Arthur Dent

ARNOLD ARBORETUM



Jenny

Leaders: Sarah Northrup
#965-4602
Agatha Clancy
#969-7407

July 19, 1994 Trip slip #12

Equipment: Boots, two pairs of
socks, Field kit, lunch, WATER

This is a really long trip!! Don't worry, we'll have fun!

If you've ever been to the Arnold Arboretum, you know it is just a place with really cool trees. Some of the trees there you wouldn't be likely to see just growing in some body's yard.

Okay, we're going someplace with lots of trees, what ever are we going to talk about? (tough question) Think we might talk about TREES? (uh, duh, ya think?) We're going to talk about the different parts of the tree, and its leaves.

Parts of the tree:

Crown - the leafy top

Cork - outside layer, used for protection

Phloem - carries food up and down the tree

Cambium - Responsible for the growth of the tree

Xylem - (2 parts) Sapwood - carries water up the tree

Heartwood - supports tree

What's the difference
between a deciduous
tree and an evergreen?
(try comparing a maple and

What are the qualifications to be a tree? (Hint: there are 4)

What are the parts of a leaf?

Remember Forest Succession? We'll talk about that, too.

ARNOLD ARBORETUM

Trip slip #12

(969-7407) Agatha Clancy

(332-5932) Rachel Kuller

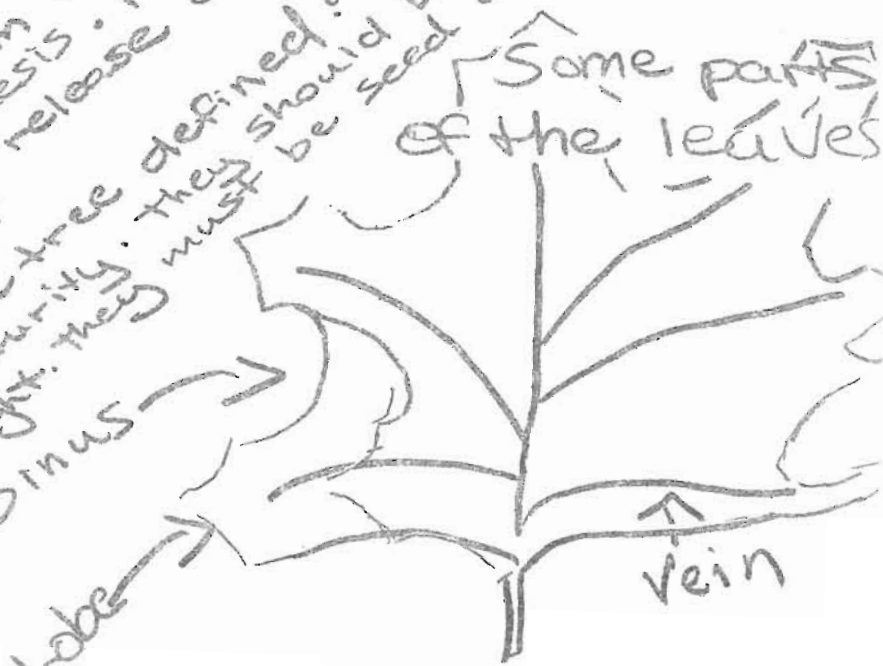
July 16, 1993

Time 9:00-3:00

equipment: 2 canteens boots
lunch
field kit

what are
two major categories
of trees. These are Deciduous
and conifers. Deciduous
Deciduous - loses its leaves in the
fall and bare branches in
the winter.
Conifer - A cone bearing tree, which has
needles on its branches instead of leaves.
It has needles all year long.

Why are trees important to the environment. They are good
for shade to keep us cool but this is not the only reason it's
cool. It keeps air cool through a process of transpiration. A tree
releases droplets of water. These droplets of water fall to the ground
and also evaporate into the air. It's the water that falls to the
ground that cools us. The water that falls to the ground why?
Trees also perform a very important process. This
process is called photosynthesis. Photosynthesis is the intake of
carbon dioxide and the release of oxygen. This is very good
because we need oxygen. This is very good why?
How is a tree defined? They must be at least
13 ft. tall at maturity. They should be 2 inches in diameter
at chest height. They must be seed or cone bearing.



ARNOLD ARBORETUM

Trip Slip #13
July 19, 1993

LEADERS: Kathy Thorp
527-3681
Gordon Roble
244-9304

Equipment: Boots, Field Kit
LUNCH, WATER,
\$ for ice cream

Times - 9-3

Why are trees so important?

- 1) they provide us with shelter, O_2 food
- 2) control soil erosion
- 3) paper + timber

Tree Facts:

Tallest tree ~ 368 ft. (Redwood)

Thickest tree ~ 30 ft. (sequoia)

There are 50,000 species of trees - only 680 are native to the U.S.

Today is going to be a long hike. Please bring lots of H_2O and dress properly - wear 2 pairs of socks. [LJ]
The Arnold Arboretum is a very interesting place, with some really unusual trees and plants as well as some common species. There's also a Banzai Garden there. We'll get to check this out also.

There are 2 major categories of trees: Deciduous and Conifers. A deciduous tree loses its leaves in the fall. A conifer has cones and keeps them all year.

3 common tree shapes ~ Pyramidal



Things to think about:
What structure causes tree growth?
How do they transport food + H_2O ?



16 July 1993... FRIDAY

Leaders: Rachel 332-5932
and
Agatha

Times: 9:00am - 3pm

Here we will see lots of trees! The Arnold Arboretum is a living museum operated by Harvard University. It has both common and exotic trees.

Deciduous

gymnosperm
angiosperm
tracheophyte

vs.

Evergreen

bryophyte
photosynthesis
transpiration

Who sabs?

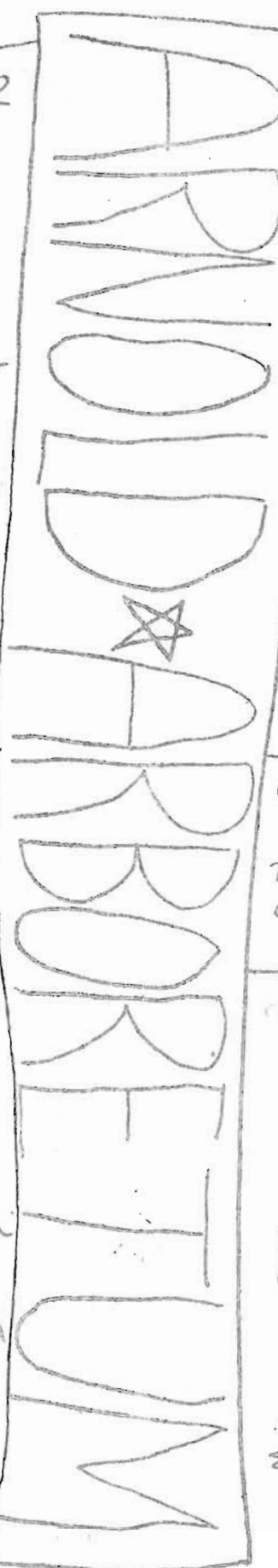
What are these terms?

What are GUARD CELLS?

FOOD FOR your FISH:

Tallest tree 368ft. high Redwood

Thickest tree... 30 feet in diameter
Sequoia



EQUIPMENT




TRIPSLIP #12

Boots, (w/2 prs of socks)

H₂O (lots o' water)

Lunch, field kit,
money if you want
to stop at the farm
stand on the way back.

GOALS:

- Identify some 
- Learn about the 
- Understand the biology of a 

"Every tree that bringeth not
forth good fruit is hewn down
and cast into the fire" - Jesus



pinnately
compound
Leaf



palmately
compound
leaf



simple
leaf



palmately
lobed



lanceolate
leaf

ARNOLD

BRILLIANT
STANDARDING
Quote:

"I'll BE BACK!"



DATE: July 17th, 1991

ARBORETUM

Leader: Delfo Trammontani

214-3877

Equipment: 2 canteens

Lunch

Field Kit

Tree Guide (we will supply)

Boots-fucking

~~~~~  
TIME: 9am - 3pm  
~~~~~

It's Going to be
Hot, Hot, HOT!

Today we will be going to a sort of tree
Sanctuary - ARNOLD ARBORETUM. Here there are many different
types of trees living and being taken care of from all over
the world. The two major types of trees are Deciduous
and conifers. A Deciduous tree loses its leaves in the fall
and has bare branches in the winter. Conifers
are cone bearing trees, which have
needles long instead of leaves and keep them all year.



Conifers
needles long.



OBJECTIVES

- Identify some trees and classify them
- Learn the importance of Trees to us
- Learn about A Tree's biology - its respiration, photosynthesis, reproduction etc...

Leaves



Parallel veins

Monocot



Branching or web veining

Dicot

Leaf



ALL LAND Plants
Bryophytes

non vascular Plant without veins vascular Plant with veins

Tracheophytes

2 seeds

without seeds (Ferns)

Angiosperms Gymnosperms
Flower Cone bearing tree

tripslip # 8
July 17, 9AM - 4PM
Arnold Arboretum
Dave, 969-6074

GROUP:

This is a long hike. It will probably take us one hour 45 minutes each way so we will have about 3½ hours to see the arboretum. Lunch will be an hour-long rest period during which I will lead a session in dendrology, the study of trees; and silviculture, man's use of trees.

Wear: regular hiking gear

Bring: your field bag, a Trees guidebook, maps,

page 3

4) to discuss man's use of trees

5) to discuss a tree's lifetime; its needs, enemies, and mode of reproduction

6) to learn of a tree's effect on the soil it grows in

7) to observe the great variety of trees collected here from all over the world

8) to learn to identify trees common to the northeast U.S.

QUESTIONS

1) What does a tree need to grow?

page 5

8) What is the history of forests in NE since 1660?

9) Which states have the most trees? How many types of forests are there in North America?

10) What would man do without trees?

11) What functions do the following have? ROOTS, BARK, SAPWOOD, HEARTWOOD, LEAFY CROWN, CAMBIUM LAYER, SEED

12) TREE TYPES (name ex.)
-coniferous (gymnosperm)
-deciduous (angiosperm)
-palms
-cacti
-yucca
(Note: Bamboos are NOT trees; they are grasses)

page 2

compass, notebook & pencil, lunch, and an extra beverage (like lemonade) Try to freeze half your canteen supply into an icecube the night before so it will be cold in the afternoon. (Don't freeze it full; it'll BURST!) Leave at NSHS the rest of your kit.

Reading: Trees; pp.

OBJECTIVES

- 1) to walk through this world famous tree "museum"
- 2) to learn the importance of trees to our lives and to the nation's economy
- 3) to study the important ecological niches which trees fill or provide shelter for

page 4

2) What stunts a tree? Kills it?

3) How do paper companies harvest trees?

4) What happens after a forest fire?

5) Why does forest succession occur?

6) Name some adaptations trees make for different biomes?

7) How many "treesworth" of paper and wood did you use last year? Where did it come from? Where will it come from next year? Why have trees been called "America's renewable resource"? What threatens this?

page 6

13) Why do leaves turn color in the fall?

14) What can be read from ring thickness?

15) How are seeds transported?

16) Why does a tree die if you cut completely around its cambium layer (inner bark)?

17) Why are trees the dominants of most land biomes?

TIME: 9 AM - 3 PM

Tom Mahoney
TRIPSLIP # 13
July 20th, 1994

EQUIPMENT: wear 2 pairs of socks
in your boots, bring 2 quarts of water,
big lunch, 1 for ice cream, 1 field kit
BRING YOUR TRIPSLIP TOO!

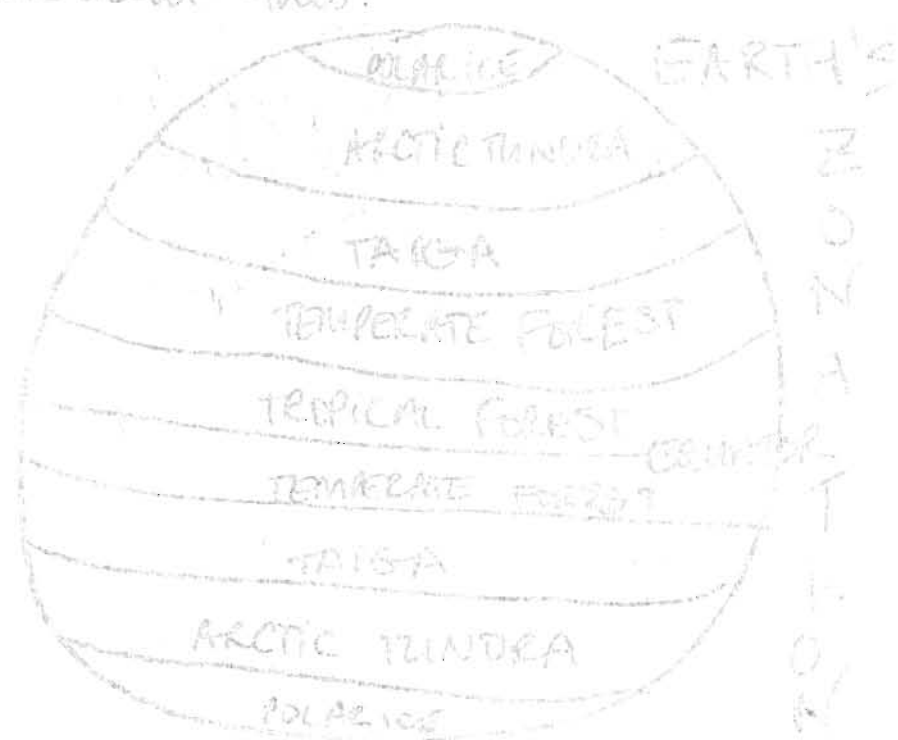
STRETCH
MUSCLES

ARNOLD ARBORETUM

(OR "AAHH VOLD ANBOR ETUM")

The Arboretum has been called
"America's Greatest Garden." It was
established in 1872, and is operated
by Harvard University. It is 265
acres of land, with over 6,000 types
of trees and shrubs from the North
Temperate Zone. What? The world is
divided into zones, which have different
temperatures and plants. We'll learn
more about this.

- TO BE A TREE:
- 1) Seeds on own
 - 2) 13' minimum height
 - 3) woody stem
 - 4) at least 3-4" in diameter



most of the
trees, and
shrubs north
of the

ARNOLD ARBORETUM

Views of trees from the Centuries

Every tree that bringeth not forth good fruit is hewn down and cast into the fire. - Jesus

The tree does not withdraw its shade, even from the woodcut
- Hitopadesa - ~~Hitopadesa~~

The tree Ydrasil, which reaches up to heaven ~~and~~ goes down to the Kingdom of hell; and God, the Everlasting good and just in it all. - Carlyle

The tree of liberty only grows when it is watered by the blood of tyrants. - Bertrand Barere

The tree of silence bears the fruit of peace - Arabic Proverb.

The tree of knowledge is not that of life - Byron

Unless a tree has borne blossoms in spring, you will look vainly for fruit on it in autumn - Hare.

Care is taken that trees do not grow into the sky - Goethe

A tree grows in Brooklyn - Betty Smith

I like em - Lassie, Snoopy, Rin Tin Tin, et al.,

What are those things people think you are mad if you talk too? Like George the Third? Trees! I practice by talking to trees - Arthur Dent

Jenny Casavant
(969-2776)
Sarah Northrup
(965-4602)

ARNOLD ARBORETUM

EQUIPMENT

Field kit
boots
pairs of Socks
IG Lunch
OTS of Water

Arnold Arboretum is a place where many different kinds of trees are grown. A lot of these are things that you find growing in someone's back yard.

Parts of a tree:

Canopy - leafy top
Apical meristem - Responsible for the growth of the tree
Bark - Outside layer, used for protection
Xylem - Carries food up and down the tree
Phloem (2 parts):
Sapwood - Carries water up the tree
Heartwood - Supports the tree

This is a very long line so to wear 2 pairs of socks and bring lots of water so you don't get hot.

Some things to think about:

What's the difference between a deciduous and a dwarfed tree?

What are the parts of a tree?

What makes a tree a tree?

Forest Succession

TRIP SLIP #11

TIMES:

9 AM
to
3 PM

MEET
AT
SOUTH

Leader: Rachel
332-5932

ARNOLD ARBORETUM

20 July 1992

EQUIPMENT:

Field kits
2 pps of socks
X-1, a H₂O
Tree guides
Pencil
Supply

THIS IS A Tree trip, hence the name
"arbo-retum". Our goals:

- ① Identify trees
- ② Learn the importance of trees
- ③ understand a tree's biology + functions
(respiration, energy, photosynthesis, reproduction etc.)
- ④ Compare + contrast different trees

What is
"lanceolate
leaf"? A
Compound leaf?
A palmately
lobed leaf?
A pinnately
lobed leaf?
A lobe?
A sinus?
A mid-rib?
A petiole?

DECIDUOUS
CAMBIUM
XYLUM
PHYLLUM
PHLOEM
PIONEERING
MID-STAGE
CLIMAX
TRANSPIRATION

FLAKES FOR YOUR BOWL

CONIFEROUS
GYMNOSPERM
ANGIOSPERM
TOOTHED
SMOOTH
BRANCHING VEINS
PARALLEL VEINS
TELLO MOLDS
PHOTOSYNTHESIS

The tallest tree in the world is a redwood tree, 115.7 m tall.

The widest tree in the world is a sycamore tree, 11.1 m wide.

The oldest tree in the world is a bristlecone pine, 4843 years old.