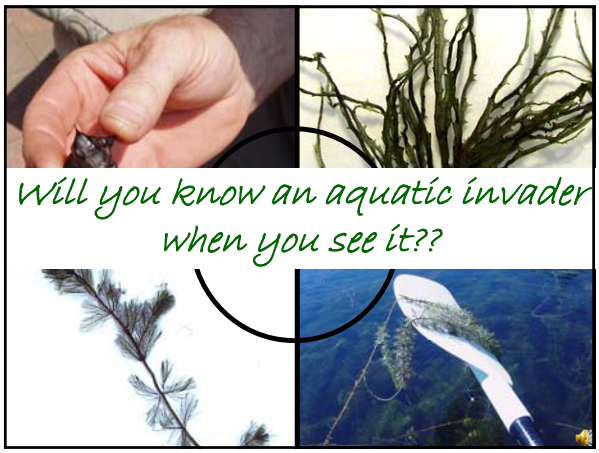


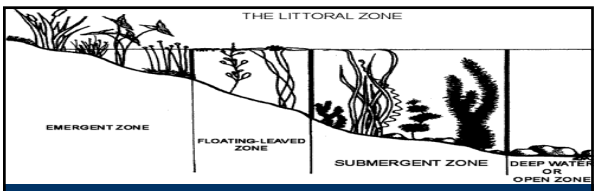
Plan of Action . . .

1: Aquatic Plant Communities

2: Plant Structure

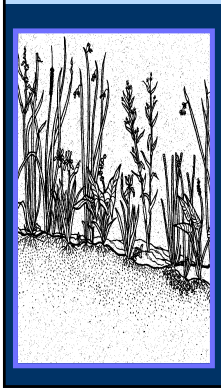
3: Maine’s Eleven Most Unwanted and their Common Native Look Alikes

4: Practice with Live Plants



Part 1: Aquatic Plant Communities

Emergent Plant Community



- shallowest zone
- from moist soil to knee-deep water
- the "wetland" plants

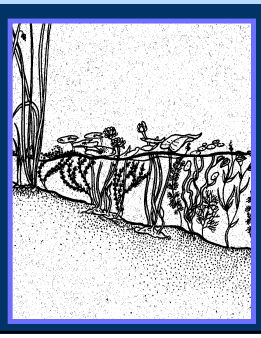
** Strictly speaking, none of the eleven listed TRUE AQUATIC invasive plants are part of this community*

Life at the water's edge can be challenging

Adaptations

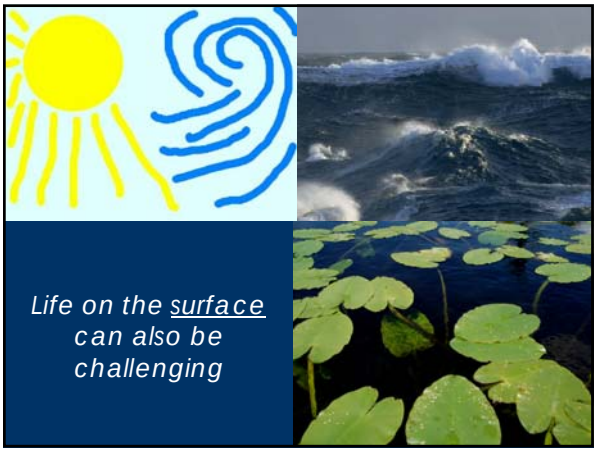
- plants can tolerate fluctuating water levels & wave action
- most have spongy, buoyant leaves and tough, interlocking roots

Floating Leaved Plant Community



- knee-deep to chest-deep water
- submersed plants may reside under this canopy

** Three of the eleven listed IAP plants are floaters*

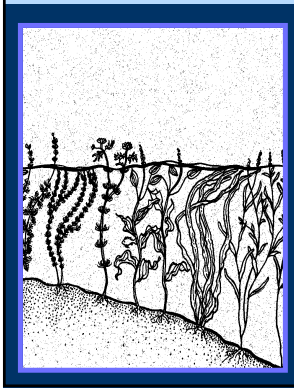


Life on the surface can also be challenging

Adaptations

- buoyant leaves, smooth margins, leathery texture, waxy "cuticle"
- tough, elastic leaf stalks; grow rapidly to surface
- some are free floating
- reproduction from seeds, turions, rhizomes

Submersed Plant Community



- from shoreline to several meters deep
- maximum depth is limited by:
  - ✓ species specific adaptations
  - ✓ light availability

** Eight of the eleven listed IAP plants are found in the submersed community*

Adaptations

- stems and leaves often flexible, leaves adapted to maximize surface area & gas exchange, lack cuticle
- most set flowers above the surface for pollinators; heterophylly (2 leaf types) often occurs in these species
- plants overwinter as rhizomes, tubers, turions (winter buds), whole plant
- Reproduction primarily by clonal expansion, also root division, seeds

QUIZ #1

Part 2: Plant Structure

Leaf Arrangement


Opposite


Alternate


Whorled

Leaf Types


ENTIRE

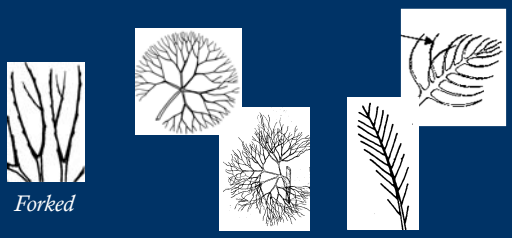

DIVIDED


TOOTHED or SERRATED


Heart Shaped


Triangular

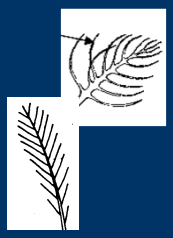
Divided Leaf Patterns



Forked *Branched* *Feather Divided*

Divided Leaf Patterns

All leafy milfoils have feather divided leaves. All aquatic plants with true feather divided leaves are milfoils.

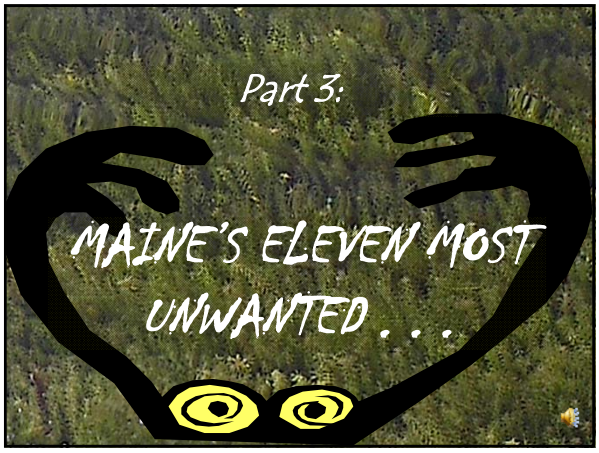


Feather Divided

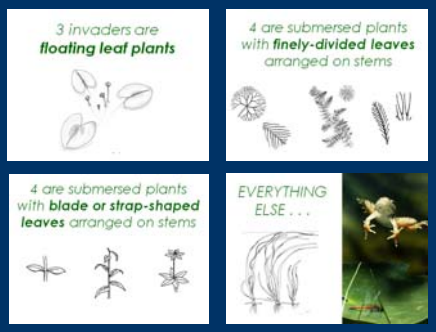
QUIZ #2

What can you say about the identity of this plant?

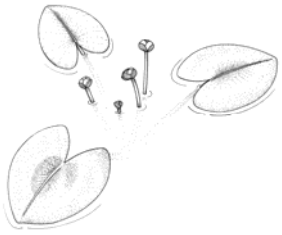
Leaf



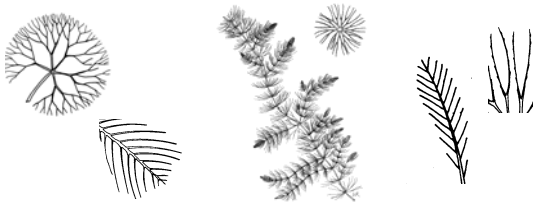
It helps to sort plants into 4 Categories



3 invaders are **floating leaf plants**



4 are submersed plants with **finely-divided leaves** arranged on stems



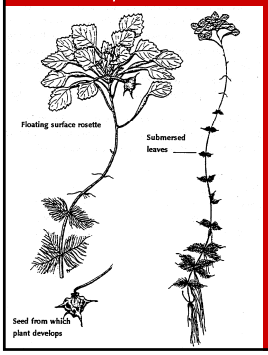
4 are submersed plants with **blade or strap-shaped leaves** arranged on stems

EVERYTHING ELSE . . .

Floating Leaved Plants

Water Chestnut

(Trapa natans)

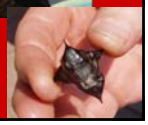


I

I

Water Chestnut

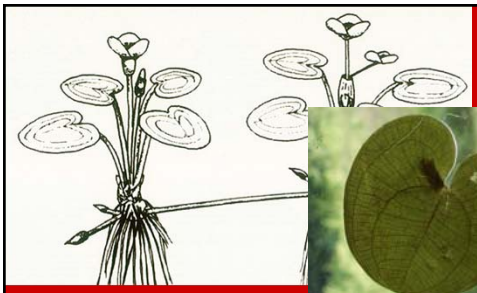
Native to Europe
Confirmed: CT, MA NH, NY, RI, VT, Quebec



European Frog Bit

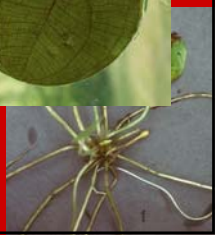
(Hydrocharis morsus-ranae)

I



I

European Frog Bit



European Frog Bit

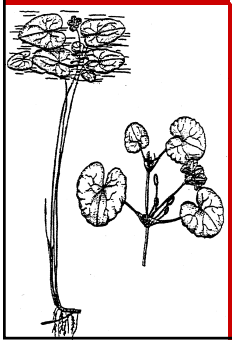
Native to Europe
Confirmed: NY, VT

I

Yellow Floating Heart

(Nymphoides peltata)

I



Yellow Floating Heart

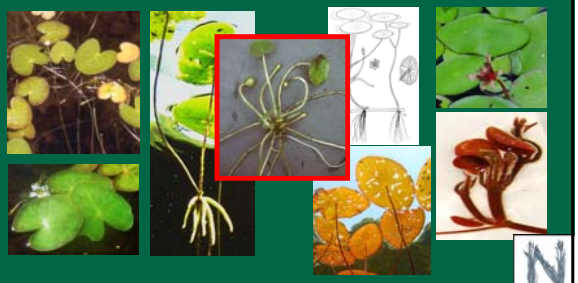
Native to Europe
Confirmed: CT, MA, NY, RI, VT

Spatterdock
(Nuphar variegata)

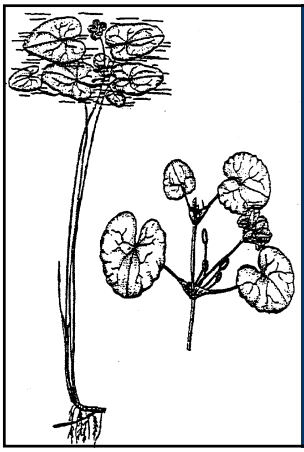
Fragrant Waterlily
(Nymphaea odorata)

Little Floating Heart
(Nymphoides cordata)

Watershield
(Brasenia schreberi)



QUIZ #3



Could this be a native floating leaf plant?

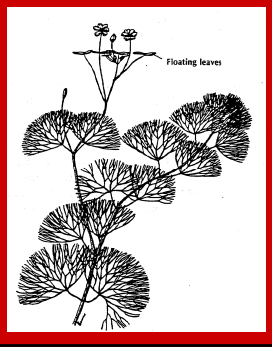
How do you know?

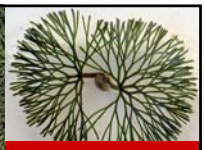
Submersed Plants with Finely Divided Leaves Attached to Stems

Eurasian water-milfoil infestation, Pleasant Hill Pond, Scarborough, ME

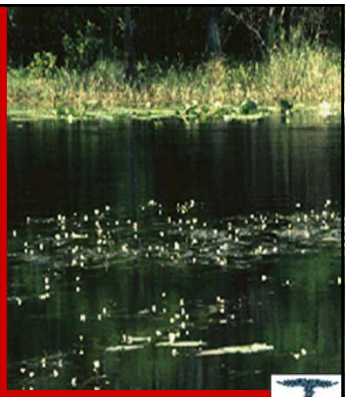
Fanwort

(Cabomba caroliniana)





Fanwort

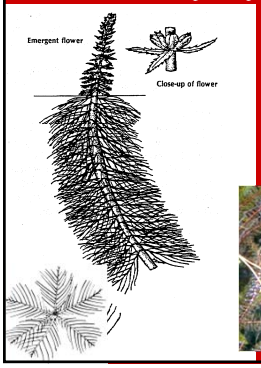


Fanwort

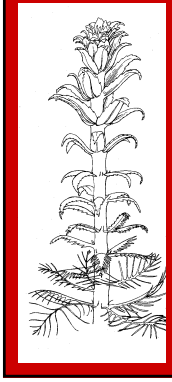
Native to South America (and SE US)*
Confirmed: CT, MA, NH, NY, RI, VT

Variable Water-milfoil

(Myriophyllum heterophyllum)



Variable Water-milfoil



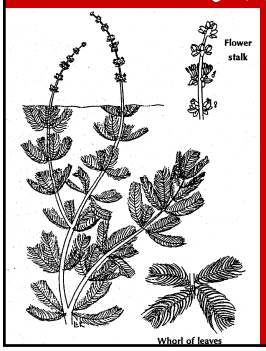
Variable Water-milfoil

Native to Europe & parts of US
Confirmed: CT, ME, NH, NY, MA, RI, VT

Hybrid Milfoil
(M. heterophyllum x M. laxum)

Eurasian Water-milfoil

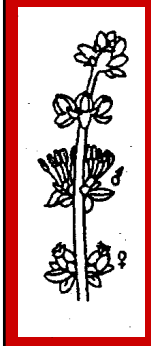
(Myriophyllum spicatum)



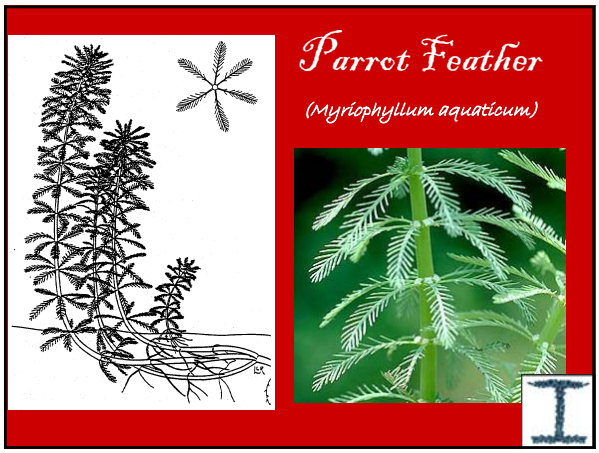
Eurasian water-milfoil infestation, Kirk Lake NY

Eurasian Water-milfoil

Eurasian Water-milfoil



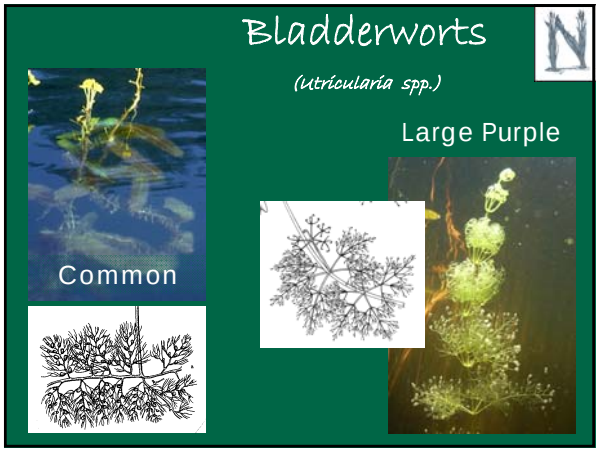
Native to Europe
Confirmed: CT, MA, ME, NH, NY, RI, VT


Parrot Feather
(Myriophyllum aquaticum)
I


Parrot Feather
I


Parrot Feather
I
Native to South America
Confirmed: CT, NY


Maine has six lake-friendly native milfoils
• Alternate-flower
• Farwell's
• Low
• Northern
• Whorled
• Dwarf (leafless)
N


Bladderworts
(Utricularia spp.)
N
Common
Large Purple

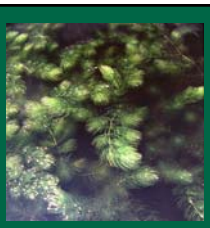

N

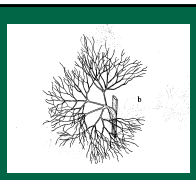
Common

Large Purple

Hornworts

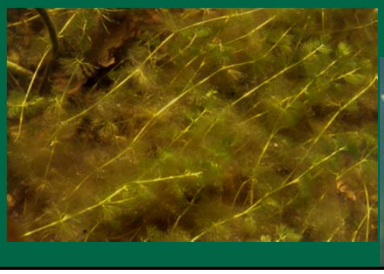
(Ceratophyllum sp.)





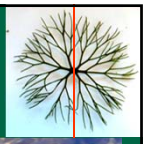
Crowfoot

(Ranunculus sp.)

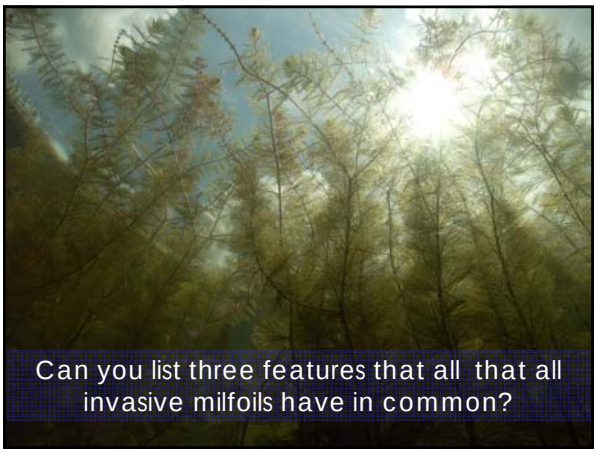


Water Marigold

(Megalodonta beckii, Bidens beckii)



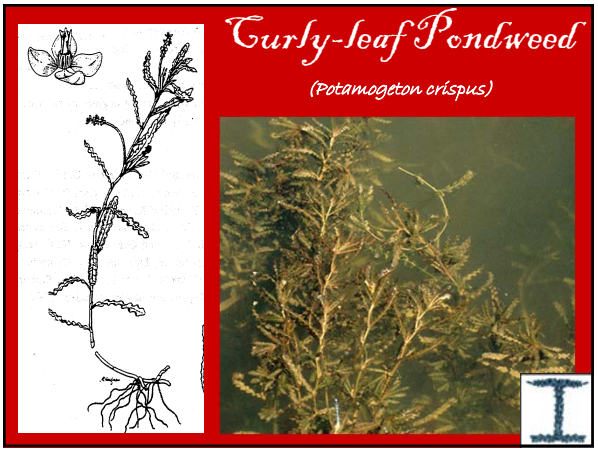
QUIZ # 4



Submersed Plants with Blade or Strap-shaped Leaves Attached to Stems

Curly-leaf Pondweed

(Potamogeton crispus)



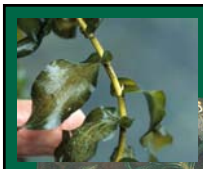
Curly-leaf Pondweed

Curly-leaf Pondweed

Native to Europe
Confirmed: CT, MA, ME, NH, NY, RI, VT

Pondweeds

(Potamogeton spp.)



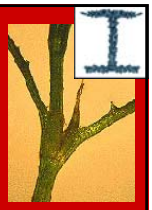
Clasping-leaf pondweeds
P. perfoliatus & P. richardsonii

Large leaf pondweed
P. amplifolius

European Naiad

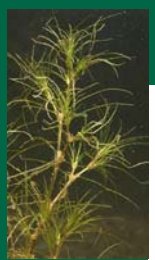
(Najas minor)

European Naiad



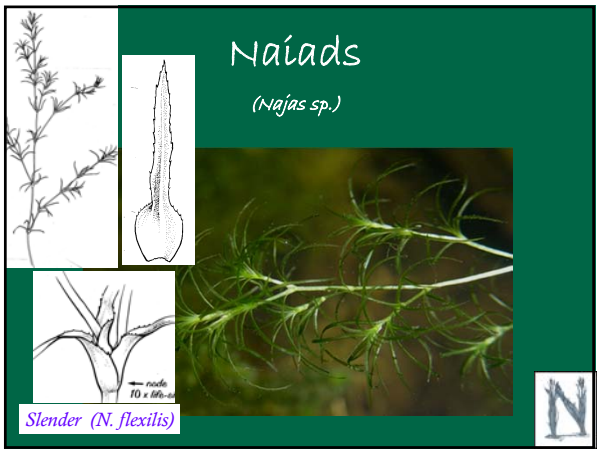
Native Naiads

(Najas sp.)



Slender naiad
(Najas flexillis)

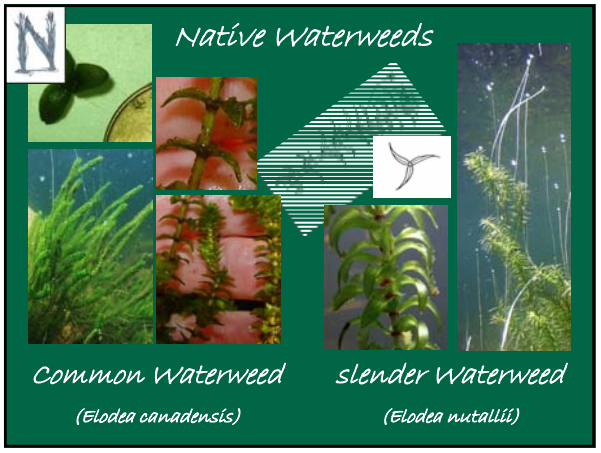
Thread-like naiad
(Najas gracillima)


Naiads
(Najas sp.)
Slender (N. flexilis)
N


Brazilian Elodea
Egeria densa (South American Waterweed, Anacharis)
I


I
Brazilian elodea is a common aquarium plant

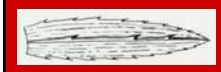

Brazilian Elodea
I
Native to South America
CT, NH, MA, NY, VT

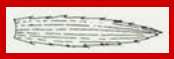

N
Native Waterweeds
Common Waterweed
(Elodea canadensis)
slender Waterweed
(Elodea nuttallii)


Hydrilla
I
(Hydrilla verticillata)

Form and Habit

Form Comparison





Theirs

Ours

Hydrilla's Edge

- Thrives in low light
- Grows to depths exceeding 30 ft
- Extreme rapid growth
- Wide tolerance range
- Propagates by clonal expansion

The Clinchers!

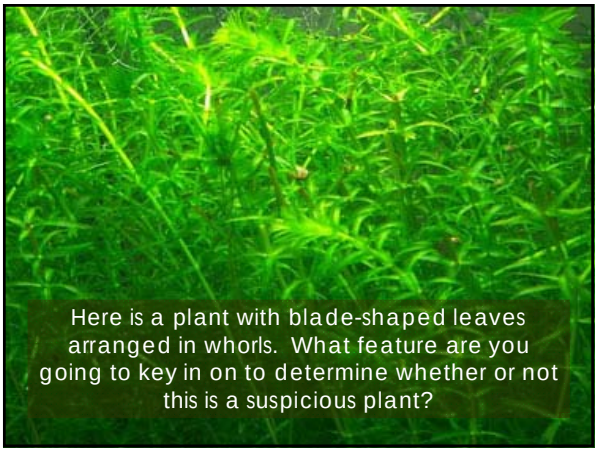
Turions

Tubers

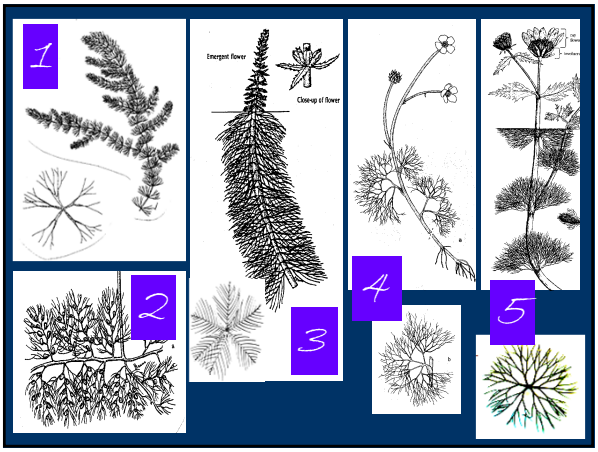
Tubers and Turions are Resilient to . . .

- Ingestion by waterfowl
- Ice cover
- Drying
- Herbicides
- Time! (Tubers remain dormant for years in the sediment)

QUIZ #5



Final Quiz!



YOU ALL PASS!
You are ready to practice with real live plants!