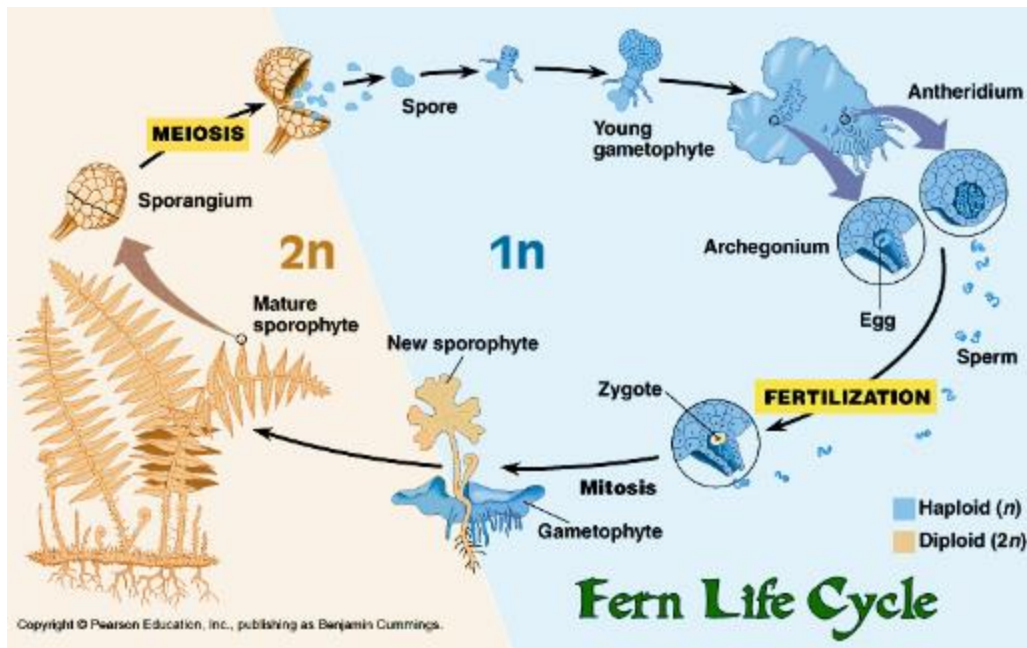


# Introduction to fern

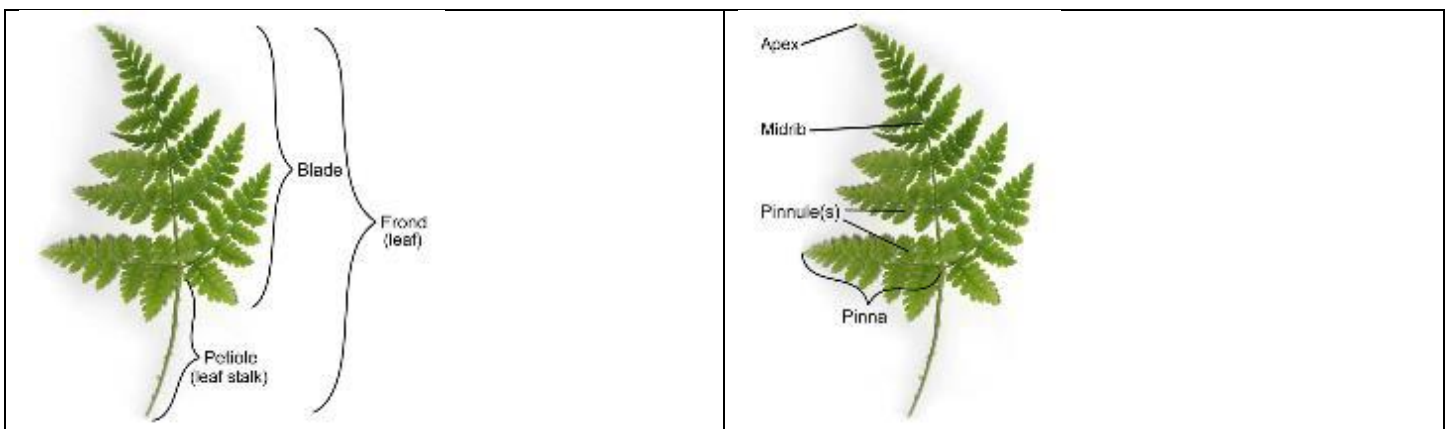
Ferns are vascular plants that produce spores for dispersal. Fern spores function similar to seeds in angiosperm and gymnosperm. When a spore germinates, it produces a photosynthetic structure call the prothallus. On the surface of the prothallus, you will find structures that contain eggs and the sperm. Once the sperm fertilizes the egg, it forms an embryo that gives rise to a fern plant that contains both sets of genetic material. The reproductive structure that houses the spore is call a sporangium. A cluster of sporangium is known as a sorus (plural is sori). The sori might be located on the underside of the frond, on the edge of the frond, along the stem( rachis) or on a separate structure. Inside the sporangium the mother spore undergoes meiosis producing spores with half the genetic material.



## CHARACTERISTICS FOR IDENTIFICATION

1. Frond anatomy (division and silhouettes)
2. Sporangia location

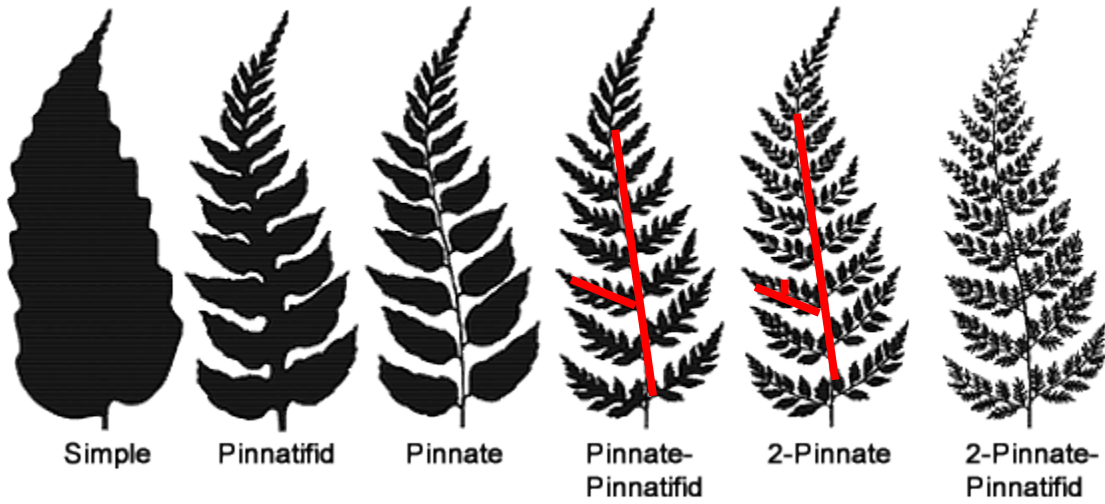
### Frond anatomy



blade may be variously divided, into segments called pinnae; single leaflets are pinna

further divided, the smallest segments are pinnules.

Leaf division



Pinnatifid

The frond is divided into segments divided from each other almost to the rachis.



Pinnate pinnatifid



Bipinnate pinnatifid



**Sori location-**

Some ferns have two types of leaves- Vegetative and fertile (contain only sporangia)



Interrupted fern- sori located along the stem of the frond



Sori located on a separate frond like structure (fertile frond)



Common Polypody- Sori located on the underside of frond



Maidenhair fern- Sori- located along the margin of frond



Grape fern- Sori wrapped around by globular tissue of leaflet



Lady fern- sori located along the veins of the frond.

## Pictorial key to fern identification

### Undivided

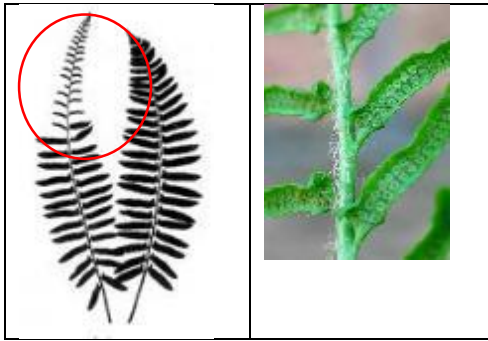


Hart's Tongue Fern (*Asplenium scolopendrium*)  
Sori- Linear formation on underside



Walking Fern (*Asplenium rhizophyllum*)  
New ferns grow from the tips of the leaves where they touch the ground.  
Random lines of sori on underside

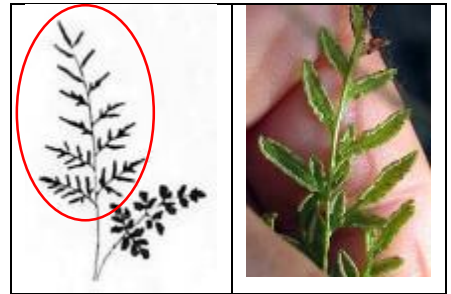
# Once divided



Christmas Fern (*Polystichum acrostichoides*)  
Two types of pinnae( leaflets) vegetative and fertile (circled in red) with sori underneath)



Common Moonwort (*Botrychium lunaria*)



Slender Cliffbrake (*Cryptogramma stelleri*)  
Fertile frond circled in red  
Sori located along rolled margin



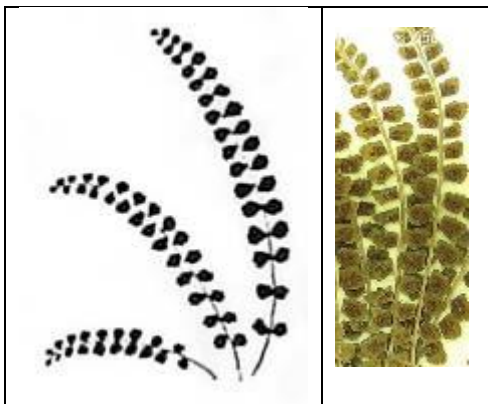
Smooth Cliffbrake (*Pellaea glabella*)  
Sori located along rolled pinnule margins



Polypody (*Polypodium virginianum*)  
Sori in rows on either side of central vein


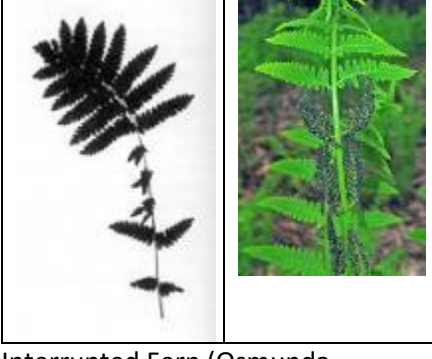





Sensitive Fern (*Onoclea sensibilis*)  
Sterile and fertile frond

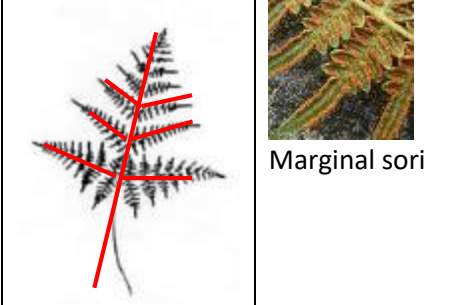

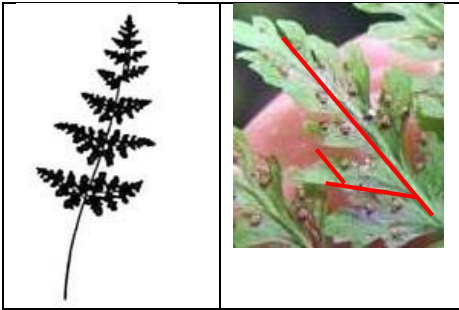


Green Spleenwort (*Asplenium viride*)  
Sori in cluster on underside of frond

## Twice Divided

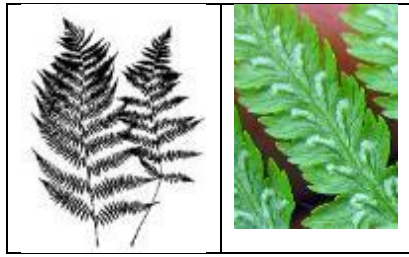
		
<p>Cinnamon Fern (<i>Osmundastrum cinnamomeum</i>) Has cinnamon coloured fertile frond</p>	<p>Interrupted Fern (<i>Osmunda claytoniana</i>) Fertile frond "interrupted" the sterile frond</p>	<p>Long Beech Fern (<i>Phegopteris connectilis</i>) Sori- along the margin of leaflets</p>
		
<p>Ostrich Fern (<i>Matteuccia struthiopteris</i>) All fronds originate from a black knob. Has separate fertile fronds.</p>	<p>Royal Fern (<i>Osmunda regalis</i>) Fertile leaflets on top of sterile leaflets (circled in red)</p>	

## Thrice Divided

		
<p>Bracken (<i>Pteridium aquilinum</i>) Marginal sori</p>	<p>Bulblet Fern (<i>Cystopteris bulbifera</i>) Bulblet vegetative reproduction</p>	<p>Fragile Fern (<i>Cystopteris fragilis</i>) Bipinnate+ pinnatifid frond Sori sparse underside</p>



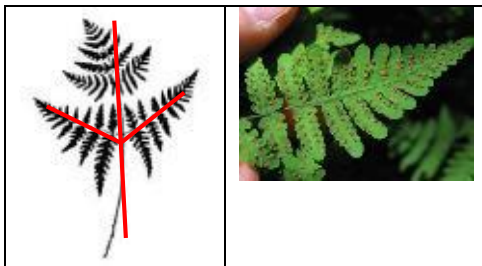
Leathery Grape Fern (*Sceptridium multifidum*)  
Bipinnate+ pinnatifid



Lady Fern (*Athyrium filix-femina*)  
Comma shaped sori near center of frond



Maidenhair Fern (*Adiantum pedatum*)



Oak Fern (*Gymnocarpium dryopteris*)  
3 part frond



Rattlesnake Fern (*Botrypus virginianus*)  
fertile stalk separates from main stem below leaves.



Spinulose Wood Fern (*Dryopteris carthusiana*)

Close up picture of sori

