

Fern Skit

There is **nonstop call and response** in this to help the student integrate things. It might take them some time, but they usually warm up pretty quickly.

KEY: **Call response** other notes

Supplies:
Silk ferns (3-4)
Beanbags 4 each in 2 colors (or non-rolling throwable things)
Throwable balls like ping pong balls, tennis balls (preferably with 10 flagella – stapling 5 pieces flagging tape in the middle into a tennis ball works well)
6-8 buckets or planters
Large paper gametophytes

Start with a minimum of 2 (max 4) sporophytes.

Each student should have a fern frond and 2-4 bean bags of the same color.

What do we call this generation?	<i>sporophyte</i>
What is the ploidal level of the individual?	<i>Diploid, 2n</i>
What does sporophyte mean?	<i>Spore-making plant</i>
So what does it make?	<i>Spores</i>
What is the ploidal level of this? (indicate spore)	<i>haploid (n)</i>
What process makes a haploid out of diploid?	<i>meiosis</i>

Okay, fern sporophytes disperse your spores. Ferns throw spores around the room.

Now what happens?	<i>Spores germinate into gametophytes</i>
What do spores always germinate into?	<i>gametophytes</i>

Recruit up to 8 students to be gametophytes. Hand them a planter and a gametophyte line drawing / photo

What is the ploidal level of the individual?	<i>haploid (n)</i>
What cellular process moves this (point to bean bag spore) to this (point to gametophyte photo)?	<i>mitosis</i>
So what is this generation called?	<i>gametophyte</i>
What does gamtetophyte mean?	<i>gamete-making plant</i>
What is the ploidal level of the gamete?	<i>haploid (n)</i>
What process makes a haploid out of haploid?	<i>mitosis</i>

Start dropping off tennis balls at the feet of the gametophytes.

So we are going to say that all these gametophytes make both big and little gametes. What does that mean for their sex? What sex are they? *Both male and female (i.e. hermaphrodites)*
Where are the little gametes made (sperm)? *antheridia*
Where are the big gametes made (eggs)? *archegonia*

Okay, the eggs are hanging out in their archegonia, which just happens to be this handy planter. The sperm are here at your feet. Ferns sperm are very cool and have lots of flagella – 10!

Now what happens? *Gametophytes have sex*
They usually freak out a bit here and don't want to say sex.

Okay, fertilize another gametophyte *gametophytes*

They try to start walking around with sperm, which is a super fun time to say **HEY! You are a gametophyte, you can't walk!** After which, hilarity ensues with tossing of sperm around the room.

After sperm are exhausted, take a tally.

Alright, whom got fertilized? So, now what do you have there? *a zygote*
What does that zygote grow into? *A sporophyte*
What is its ploidal level? *Diploid, 2n*
What will it make? *Spores*

What are spores made IN? *a sporangium*
What are sporangium grouped into? *A sorus*
What do we call multiple sorus together? *Sori*
What is its ploidal level of the frond, the sori, the sporangia? *Diploid, 2n*

If you feel absolutely sick of asking questions and saying the words haploid diploid spore gametophyte gamete spore then you have repeated yourself sufficiently. Well done!

Extension:

Remind students about which cellular process – meiosis or mitosis – reshuffles and allows genetic diversity. (meiosis) Then ask them which process produces gametes in plants. (mitosis) Point out that in the case we just explored, the gametes are genetically identical to the gametophyte that made them. Then ask what would happen if a hermaphroditic gametophyte had sex with itself? (utter loss of heterozygosity in resulting sporophyte generation).

You can check the different kinds of mating by looking back at the color of the beanbag spores that made gametophytes. Different color = gametophytes were outcrossing. Same color = inbreeding with a sibling. Ask if any hermaphroditic gametophytes had sex with themselves. This is **ULTIMATE INBREEDING**. It is a **GENIUS** ecological strategy and a **DREADFUL** evolutionary strategy.