

NAME: _____

ARE PALMS MONOCOTS OR DICOTS?

Do you think palms are more closely related to a lily (a monocot) or an oak tree (a dicot)? Examine the characteristics of palms and compare them to characteristics of known monocots and dicots to find out if palms are monocots or dicots.

Materials:

“Do palms have flowers?” handout
Monocot and dicot characteristics table
Substitute diagrams: lily flower, dicot flower, oak leaf, lily leaf
Dissecting tools
Hand lens or dissecting microscope

Part I: Flowers

Lily flower, example of a monocot flower
Palm flowers; collect from beneath a palm
Dicot flower

Part II: Leaves

Leaf venation diagram
Oak leaves
Palm leaves
Monocot leaves

Part III: Seeds

Palm seedlings - located at the base of some palm trees, especially those where organic mulch covers the soil, dig up with a shovel and remove dirt
Germinating corn*
Germinating dicot or
Dicot seedling - often found at the base of trees or bushes where there is mulch, dig or pull up the seedling by holding the stem at ground level

*To germinate seeds put the seeds between two layers of wet paper towel and leave for approximately 3-5 days. Keep the paper towels moist. Popcorn kernels (do not use microwave popcorn) and other food seeds such as bean seeds germinate well.

Part I: INVESTIGATE FLOWERS

Before dissecting your flowers, hold them and look at them closely. Answer the following questions for each of your flowers:

1. Count how many sepals and petals your flower has. If you cannot distinguish **petals** from **sepals**, then your flower may have what are called **tepals**. Count them.

Flower 1: palm flower sepals _____ petals _____ tepals _____

Flower 2: monocot flower sepals _____ petals _____ tepals _____

Flower 3: dicot flower sepals _____ petals _____ tepals _____

2. Find the male flower parts; count how many **stamens** you see. If your flower is tubular, you may have to cut it open to do this. If there are more than 10 stamens, simply write "many."

Flower 1: palm flower stamens # _____

Flower 2: monocot flower stamens # _____

Flower 3: dicot flower stamens # _____

3. Find the **ovary, stigma, and style** (female flower parts); cut the ovary in half (cross section) and count how many **ovules** you see. A flower's ovary will mature into the fruit while the ovule will mature into the seed.

Flower 1: palm flower ovules # _____

Flower 2: monocot flower ovules # _____

Flower 3: dicot flower ovules # _____

CONCLUDE:

Palm flowers more closely resemble **monocot flowers** _____ or **dicot flowers** _____

because _____.

Part II: INVESTIGATE LEAVES

1. Look at the leaves and determine the type of venation (vein pattern) of each leaf. Write whether the venation is netted or parallel.

Leaf 1: palm _____

Leaf 2: dicot leaf _____

Leaf 3: monocot leaf _____

CONCLUDE:

Palm leaves have the same vein pattern as **monocot leaves** _____ or **dicot leaves** _____.

Part II: INVESTIGATE SEEDLINGS

1. Compare the three types of seedlings: the palm seedling, the dicot seedling, and the corn seedling.

The term monocot is short for monocotyledon – a term meaning one cotyledon. What do you think the term dicot is short for? _____.

Look up cotyledon in a dictionary or text book. Write the definition below.

2. Read “Know your coconuts” from the “Do palms have flowers?” handout. What function does the cotyledon serve for a coconut seedling?

3. Cotyledons look different than the later leaves of a seedling. How many cotyledons can you find on the corn seedling? On the dicot seedling?

OVERALL CONCLUSION:

I hypothesize that palms are more closely related to **monocot** _____ or **dicots** _____

because _____.