

WEEKDAY WONDERS



Content developed by the
Tennessee Aquarium
Education Department



TENNESSEE
AQUARIUM



Inherited Characteristics: Day 4

This week, Weekday Wonders encourages young scientists to discover what makes each of them unique. Your young scientist will make observations to help him or her learn why parents and offspring often look alike but are never exactly the same. Young scientists will also get a glimpse into how environmental factors can change our genetics and the way we look.

These curated activities are listed in a suggested sequence but may be done in the order that works best for you and your young scientists. Learn more about this series in the [Introduction to Weekday Wonders](#).



Question of the Day

Why are only some characteristics of offspring the same as their parents'?



Daily Nature Journal

Ask your young scientists to spend some time outside completing their daily nature journal. Use the [Guide to Nature Journaling](#) to support them in nature journaling each day. Have your scientist continue to compare different living things of the same kind to try to spot any similarities or differences that s/he has not noticed before.



A Secret Code

In the “Heads or Tails?” activity in [yesterday’s Weekday Wonders](#), your young scientist began to explore why a flower does not look exactly like its parent flowers. Today your scientist will take a deeper look into one reason that only some characteristics of a living thing are like those of its parents.

Have your young scientist collect four sets of 6 objects that are the same color. For example, this could be 6 red candies, 6 blue candies, 6 green candies, and 6 yellow candies. Colored paper, paper clips, or colored pasta might be other choices. He or she will also need crayons, pens, or colored pencils in the same colors of the objects chosen.

While your scientist is gathering the sets of objects, print or draw the figures on page 3 of this document. Have your scientist choose a color for each of the grandparent fish. Your scientist should color the 6 small boxes within the fish figure the color for that fish. For example, one grandparent might have 6 red boxes and another might have 6 yellow boxes.

Then have your scientist close his or her eyes and choose 3 of the objects from the grandmother and 3 from the grandfather of the father fish. Ask him or her to place those 6 objects on the father fish and color in the 6 boxes according to the colors of the objects. Have your scientist repeat this process with the grandmother and grandfather of the mother fish.

Now your scientist should have two generations with colored boxes. For the four offspring fish, your scientist should draw three objects from the father fish and three from the mother fish. You may need to remind him or her about closing eyes! Once your scientist has colored in the boxes for offspring one, put all of the father fish objects and all of the mother fish objects back in place.

Ask your scientist to repeat this process for the remaining fish, making sure that the objects are all back in place on the mother and the father before moving on to the next offspring fish.

Once your scientist has colored in all the boxes, have him or her observe whether any of the offspring fish are the same as each other, one of the parents, or one of the grandparents. Tell him or her that each fish has its own secret code to make up its special combination of characteristics. That is how the fish can share some characteristics, but not others, with its parents.



Solving the Secret Code

Make a square hopscotch board like the one in the following picture. You can use sidewalk chalk, tape, or markers on butcher paper. Make sure the squares are big enough for your young scientist to stand in. Be sure to write the capital and lowercase letters on the outside of the grid. Your scientist will also need a rock or coin, a piece of paper, and a writing utensil.

	B	b	B	b
b	Bb			
b				
b		bb		
b				

Have your scientist throw a rock or coin onto the grid. Then have him or her hop on each square until s/he reaches the object. Younger scientists should hop on both feet while older scientists might hop on only one foot.

When your scientist reaches the square with the coin, he or she should determine the two letters on the outside of the grid that align with the box. Have him or her write the two letters in the box. For example, for box 1 your scientist should record the letters Bb. For box 10, your scientist would record bb.

Ask your scientist to continue tossing the coin, hopping to the square, and determining and recording letters in the square. Challenge them to try to throw the object into a different-numbered square each time. For older scientists, have them try to throw the object into the boxes in order from 1 to 16.

Have your scientist work to complete the entire grid. Then have him “solve” the secret code. Your scientist should find that they always had a Bb or a bb. Tell your scientist that the letters on the outside represent parents. The one with all lowercase letters has blue eyes and the one with both capital and lowercase letters has brown eyes.

The letters they wrote in the hopscotch board represent the eye color of the children the people might have. Ask your scientist if they can solve the eye colors and write them in the boxes. Then have them tally the number of times each color would appear. In this case, your scientist should realize that Bb represents brown eyes, while bb represents blue eyes. Your scientist should also see that the two eye colors would appear in about the same number of children based on these two parents.



Nature Journal

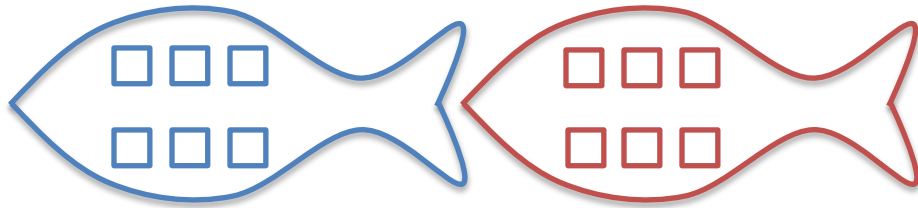
Tell your scientist that some of our characteristics are inherited from our parents. These include the characteristics that they have seen throughout the week, such as rolling a tongue, hair color, eye color, and height.

Ask your scientist to consider what characteristics they have that were not inherited. Give him or her an example such as, “I have dimples,” being an inherited trait, but “I greet people with a smile,” as a characteristic that was not inherited. That is a tradition or choice. Another example might be, “I have allergies,” as something he or she inherited, but “I care for a pet,” as something that is a chosen trait.

Encourage your scientist to think of several things that are traditions or choices. Have him or her write each one down. Have him or her pick one of the traditions or choices and write more about why they like that trait for him- or herself.

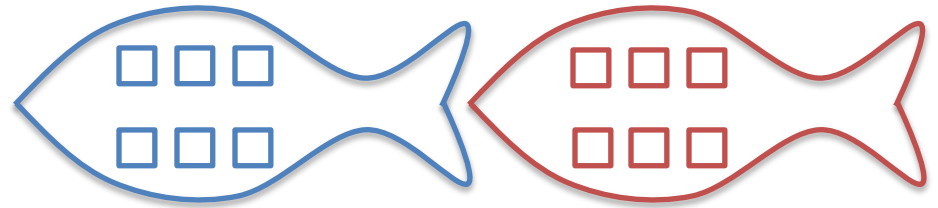
For older scientists, extend this activity by having him or her write about another living thing. Some living things, like trees, do not make choices but might still have traits that they did not inherit. For example, a tree might have birds that have made a nest in the branches, bugs that have eaten the leaves, or a swing that humans put in it.

A Secret Code Observation Sheet



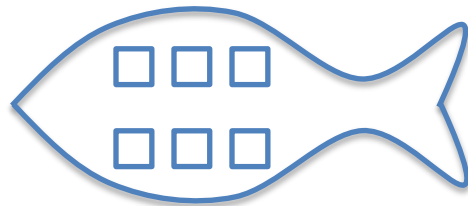
Grandfather
(mother's father)

Grandmother
(father's mother)

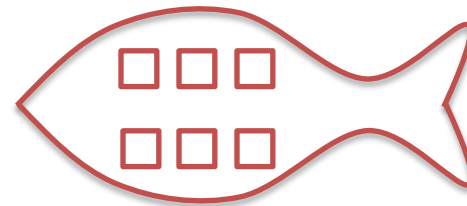


Grandfather
(mother's father)

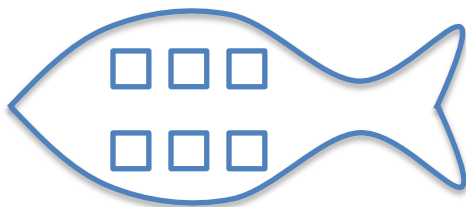
Grandmother
(mother's mother)



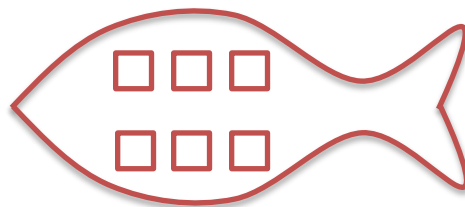
Father



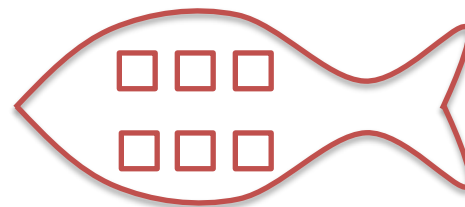
Mother



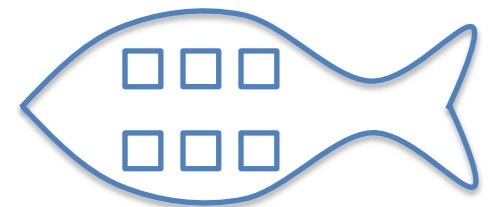
Offspring 1



Offspring 2



Offspring 3



Offspring 4