

# Summer Reading Book

## Your Inner Fish by Neil Shubin

### Inner Fish Pt 1 <insert your name here> Chapters 1-6

**Due date: August 1<sup>st</sup>, 2017**

Please answer the following questions completely and with specific, cited examples from the chapter when possible. When you are using an example from the chapter, please put the phrase in quotes and include the page number in parentheses at the end of the sentence. Each question requires a *minimum* 3-4 sentence response, often longer.

#### Chapter 1

1. Explain why the author and his colleagues chose to focus on 375 million year old rocks in their search for fossils. Be sure to include the types of rocks and their location during their paleontology work in 2004.
2. Describe the fossil Tiktaalik. Why does this fossil confirm a major prediction of paleontology?
3. Explain why Neil Shubin thinks Tiktaalik says something about our own bodies? (in other words – why the Inner Fish title for the book?)

#### Chapter 2

1. Describe the “pattern” to the skeleton of the human arm that was discovered by Sir Richard Owen in the mid-1800s. Relate this pattern to his idea of exceptional similarities.
2. How did Charles Darwin’s theory explain these similarities that were observed by Owen?
3. What did further examination of Tiktaalik’s fins reveal about the creature and its’ lifestyle?

#### Chapter 3

1. Many experiments were conducted during the 1950s and 1960s with chick embryos. They showed that two patches of tissue essentially controlled the development of the pattern of bones inside limbs. Describe *at least one* of these experiments and explain the significance of the findings.
2. Describe the hedgehog gene using several animal examples. Be sure to explain its function and its region of activity in the body.

## Chapter 4

1. Teeth make great fossils - why are they “as hard as rocks?” What are conodonts?
2. Shubin writes that “we would never have scales, feathers, and breasts if we didn’t have teeth in the first place.” (p. 79) Explain what he means by this statement.

## Chapter 5

1. Why are the trigeminal and facial cranial nerves both complicated and strange in the human body?
2. List the structures that are formed from the four embryonic arches (gill arches) during human development.
3. What are *Hox* genes and why are they so important?
4. *Amphioxus* is a small invertebrate yet is an important specimen for study, why? Be sure to include characteristics that YOU share with this critter!

## Chapter 6

1. Early embryonic experiments in the 1800s led to the discovery of three germ layers. List their names and the organs that form from each.
2. Describe the blastocyst stage in embryonic development.
3. What is meant by “ontogeny recapitulates phylogeny?”
4. What type of gene is *Noggin* and what is its function in bodies?
5. Sea anemones have radial symmetry while humans have bilateral symmetry but they still have “similar” body plans, explain

