

Epigenetic Scenarios

Based on <http://www.letsgethealthy.org/lessons/baby-epigenome/>

Directions:

As you read the following scenarios, Underline the environmental factors and lifestyle choices that led to the epigenetic results.

Mom's Pregnancy Diet

- **Whole Food:**

While the monster's mom is pregnant, she takes on a whole food diet and is off the charts in healthiness. Her meals include: loads of fruits and veggies, whole grains, nonfat milk, lean proteins, foods low in sodium, seafood, and very few solid fats. During the day she drinks close to 64 fluid ounces of water. **Result:** the baby is born normal sized and with healthy organs.

- **Junk Food/Starvation:**

While the monster's mom is pregnant, she decides to throw all caution to the wind and eats whatever and whenever she wants. Ordering a large pizza, with all the toppings, in the middle of night and eating it all by herself, all at one time, becomes the norm. That little snack is often followed by a pint of Ben and Jerry's, while watching Dr. Oz. **Result:** the baby is born underweight with small organ and diabetes, but then becomes obese in childhood.

Mom's Stress During Pregnancy

- **Low stress:** Your monster's mom got her dream job right out of college. She has been working at her office for quite some time, and knows that she has a good health plan and will get several months of paid maternity leave. She was never worried about losing her job, or paying her bills once the baby was born. Whatever job related stress she had, she was able to let it go during her bi-weekly yoga classes, which she made a point of never missing. **Result:** stress free pregnancy = healthy baby.
- **High stress:** While your monster's mom was pregnant, she was told that the start-up company where she worked was going under. As one of the most recent hires, she was going to be one of the first to go. She set about finding a new job, but weeks turned into months without finding any job. She had been good about saving money before she lost her job, but as time went by, her savings dwindled. Although your monster's father has a nice job, they were forced to move to a lower rent house. Both parents were constantly worried about how to pay for the new baby. **Result:** baby is born underweight with malformed organs.

Monster's Life Choices and Environment

Nutrition

- **Whole Food:**

Early on, your monster learns the importance of eating healthy whole foods. Your monster tries to have one helping from each of the five food groups in every meal to balance his nutrient intake. This means that he eats a great variety of fruits, vegetables, grains, dairy and protein daily. **Result:** monster maintains a healthy weight.

- **Junk Food:**

Your monster never learned the value of proper nutrition. His daily diet includes frozen pizza, fried chicken nuggets from his favorite fast-food restaurant and a variety of microwave dinners. The closest he gets to a vegetable is French fries dipped in lots of ketchup. Every time he steps on a scale he promises himself to do better, but the bad habits never change. **Result:** Monster is obese and has diabetes.

Sleep

- **7-8 hours:** Your monster, now an adult, has read about the link between sleep and possible health risks. He makes it a point to limit screen time in the evenings, and does his best to go to bed at roughly the same time every day. Since he knows that he has to get up around 6 in the morning to go to work, he is never up past 10 p.m. **Result:** healthy.
- **Less than 6 hours:** Even though your monster has been told he gets cranky when he does not have enough sleep, he likes to stay up watching TV every night. He rarely makes it to bed before midnight, and then fiddles around on his iPad for at least an hour before finally shutting it down. When the alarm goes off in the morning at 6:00, he “snoozes” it a couple of times, but in the end he knows he has to get up. It is only on rare occasions that your monster gets more than 5 hours of sleep. **Result:** due to a lack of sleep, your monster looks older than he is, he has dark circles under his eyes and yawns often. At an early age, your monster suffers a stroke.

Air Pollution:

- **Country:** As a young adult, your monster made a lifestyle choice and decided to move away from the city. He figured that getting away from the air pollution in big cities would be a healthier choice. The town where he settled is surrounded by a beautiful forest. The air is fresh and the sky is clear. **Result:** Your monster has healthy lungs and is cancer free.
- **City:** As a young adult, your monster decided to move to a big city. He really likes the hustle and bustle and being able to go to all different shows and restaurants. Unfortunately, pollutants are everywhere and from seemingly everything – cars, trucks, planes, and factories. While the

opportunities are good and the lifestyle fun, your monster one day finds that it is hard to breathe and visits a doctor. **Result:** Your monster develops lung cancer.

Exercise

- **Athlete:**

As an adult, your monster jogs for 30 minutes each morning, and goes to the gym after work three times a week. Although he got a job as a computer programmer and spends most of his time at the office sitting in front of a screen, he makes it a point to take “stand-up” breaks to relieve his cramped muscles. He spends a lot of his weekends outside playing with his dog or hiking with friends. **Result:** healthy.

- **Couch Potato:**

As an adult, your monster got a job as a computer programmer and spends most of the time at the office sitting in front of a computer. He often gets engrossed in what he is doing and forgets to get up at all, eating a quick sandwich at his desk. After a long day at work, your monster gets home and sits in front of the TV to relax. He jokingly says that the last time he put on a pair of shorts and sneakers was to go to a Halloween party. **Result:** heart disease and depression.

Chronic Stress

- **Low stress job:**

Your monster has learned how to manage the stresses of his computer programmer job. Whenever a big project rolls around, he knows to break it down into controllable steps. He keeps a list of must do's and should do's and plans accordingly in order to not get overwhelmed. He also learned to leave work “in the office”, and enjoy his life outside of the office. **Result:** healthy.

- **High stress job:**

Hour after hour, day after day, your monster is under a lot of stress. Although he loves his job, his boss and co-workers are constantly asking him to do things for them and he does not know how to say no. He often fiddles around with stuff not paying attention to the time, which often leads him to get behind on big projects. He is under a lot of stress all the time. **Result:** obesity, malnutrition, and hair/scale loss.

Your Monster's Environment and Epigenome*

Flip a coin 3 times for each scenario. For every flip, heads means the positive scenario and tails means the negative scenario. Circle the number of times the coin lands on tails, then underline your monster's epigenetic result.

Environmental Factor	# of (-) results (tails) out of 3 flips	Lifestyle	Child's Epigenetic Result
Mom's Diet During Pregnancy	0 - 1	Whole Food	Healthy
	2		At Risk
	3	Junk Food/Starvation	Obesity ; Small Organs
Mom's Stress During Pregnancy	0 - 1	MOM Low stress	Healthy
	2		At Risk
	3	MOM High stress	Premature birth
Nutrition	0 - 1	Whole Food	Healthy
	2		At Risk
	3	Junk Food	Obesity
Sleep	0 - 1	7-8 hours	Healthy
	2		At Risk
	3	Less than 6	Cancer
Air Pollution	0 - 1	Country	Healthy
	2		At Risk
	3	City	Cancer
Exercise	0 - 1	Athlete	Healthy
	2		At Risk
	3	Couch Potato	Heart Disease ; Depression
Chronic Stress	0 - 1	Low stress job	Healthy
	2		At Risk
	3	High stress job	Heart Disease Hair Loss

Adult Monster Drawing - Epigenetics

Draw your monster's organs, body shape, and face below taking into account the epigenetics they have acquired over a lifetime. For instance if they have become obese be sure to add the weight and if they have smaller organs or cancer be sure to show the effects inside the body.