

# Practice Tips:

## Disease Detectives



### Event Focus:

These apply to the DeKalb 2017 Olympiad.

The description for Disease Detectives covers a lot of territory even for the elementary grade (Level A) Science Olympiad event. At our DeKalb Olympiad, we will focus on:

- food-borne illnesses and their causes (primary focus for the GA ESO in 2017);
- well-established environmental and behavioral causes of disease;
- injury classification and prevention;
- body systems and anatomical descriptions.

We typically test the students' ability to interpret diagrams, posters, physical models, and replicas to answer questions related to the categories above. Your student should expect to demonstrate basic science and math skills appropriate for this age level, for example, measure the length of an identified object in cm using a ruler we provide, or calculate the average of 2 or 3 integers by hand or with a calculator.

### PARENT and TEACHER ADVISORY NOTE:

Parents and teachers should plan to work directly with students while preparing for this event when examining web sites and printed materials. It is well-known that many diseases are spread by behaviors that are **not** part of our event, STDs or STIs, for example. As a result, web sites that provide age-appropriate information about the details of various food-borne pathogens often link naturally and quickly to other pages containing material that most parents would consider **not age appropriate**. In particular, this is often true of disease-related webpages produced by the US Centers for Disease Control and Prevention (CDC). Please keep this in mind as you work with your students.

### USEFUL WORDS TO KNOW:

Here are some representative words you should know.

Outbreak	Communicable	Virus	Asthma	Average
Epidemic	Non-communicable	Pathogen	Influenza	Ratio
Contagious	Allergen	Bacteria	Tuberculosis	Fraction
Chronic	Congenital disorder	Germ	Fever	Comparison
Acute	Environmental toxin	Carcinogen	Cancer	Estimate
Vaccination	Disease vector	Mold	Rash	Likelihood



**RULE CLARIFICATIONS:**

These apply to the DeKalb 2017 Olympiad.

1. Food-borne illness is a focus both for our event and the state Elementary Science Olympiad in 2017. We will also feature chronic diseases this year.
2. Contestants may be asked to identify a disease or illness and name preventative measures, or they may be asked to interpret a chart or graph.
3. We provide calculators for this event. They are a relatively simple type used for bookkeeping and have nice, large keys. Calculations will only involve simple math.

**USEFUL THINGS TO TRY:**

Practice with your teacher or at home with a parent.

1. Help you parent or guardian prepare and cook a meal featuring different types of foods, such as vegetables and meats. Do the food-safety standards differ? See if you can make a list of recommended steps for each of the following when you are finished. (Need some hints? Check out the link to the posters later in this Tip!)
  - (a) Hand-washing guidelines for the cook;
  - (b) Surface preparation and cleaning before cooking;
  - (c) Food storage concerns and cleaning prior to cooking;
  - (d) Knife and utensil usage during and cleaning after cooking;
  - (e) Kitchen and dish clean-up after eating;
  - (f) Left-over storage issues and guidelines.
2. The body has nine major systems. What is the function of each one? What are some common ailments of each system? What are your body's natural mechanisms for fighting off common diseases?
3. Use the web sites below to identify the top 4 or 5 culprits in foodborne illness in the United States. For each of the causes, are there any types of foods that are more likely to have this contamination?
4. Think about different foods you have in your kitchen at home. Why is it OK to keep some of them on a shelf and not in a refrigerator? Sort the foods in the list below into two groups: "OK on a shelf" and "Goes in the fridge."
  - (a) Dry, uncooked rice;
  - (b) Swiss cheese;
  - (c) An unopened 2-liter bottle of Coca-Cola;
  - (d) An unopened gallon of milk;
  - (e) Cereal in a box.
  - (f) Uncooked eggs in a carton
  - (g) Beef jerky
  - (h) Left-over barbequed chicken from a cook-out
5. Research and identify diseases associated with the following environmental risk factors: radon gas, tobacco or tobacco smoke, ultraviolet light (UV radiation), mercury. Are any of these diseases you identified communicable?

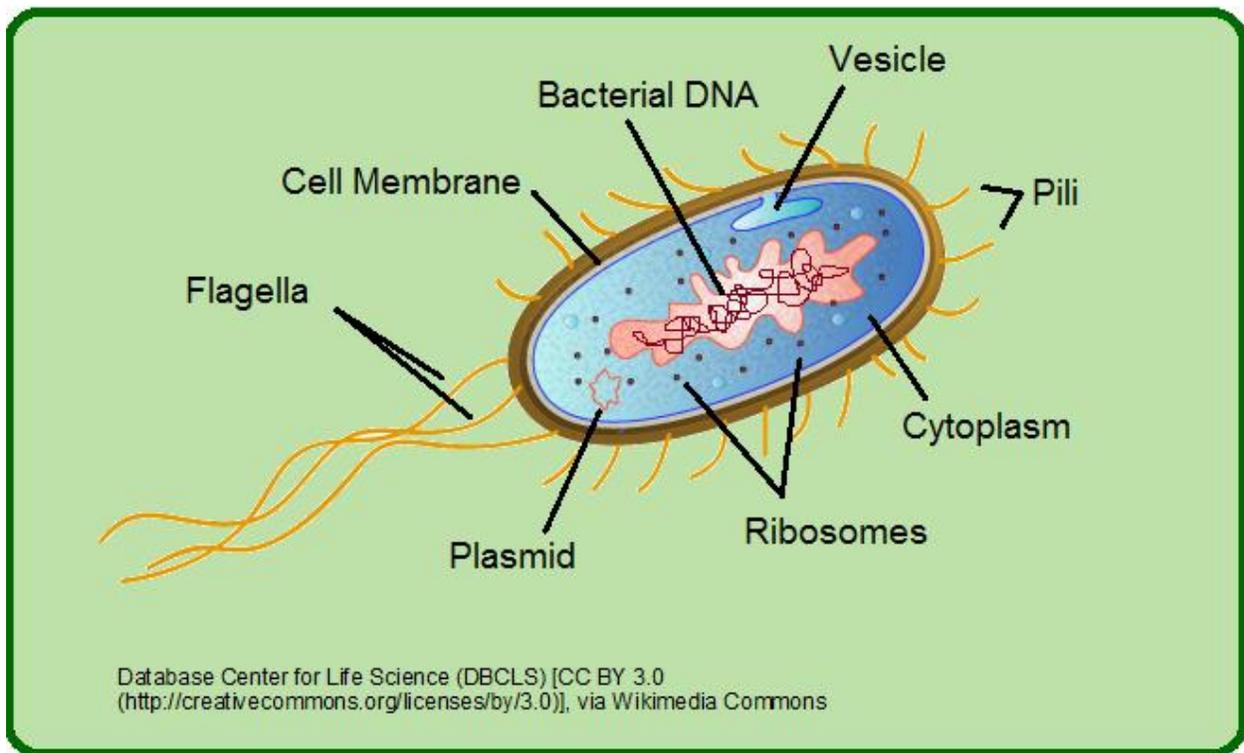
6. See if you can list at least one **infectious disease** and one **chronic disease** for each of the organs or body parts below.
- (a) Eye                      (b) Skin                      (c) Liver  
 (d) Bones                    (e) Lungs                    (f) Stomach
7. Use the table below to find these answers. How many children went to the picnic? What percentage of students got sick? What fraction of the girls threw up that day?

Student Illness Report for Spring Picnic		
Gender of student	Symptom	Number
Male	None	12
	Vomited or regurgitated that day	3
	Diarrhea on following day	8
Female	None	15
	Vomited or regurgitated that day	6
	Diarrhea on following day	1

8. Look at the picture below and identify 5 different hazards or violations of commonsense kitchen safety rules. Can you find 10? What about 15? (Image credit: <http://www.catalyststockton.org/> 2015)



9. The image below show a simplified view of an *Escherichia coli* bacterium, commonly known as *E. coli*. What is its role in human disease? What is the job of the bacterial DNA? Why are **plasmids** important for disease treatment in humans?



**USEFUL WEBSITES TO SEE:** We verified these in January, 2017.

[http://kidshealth.org/kid/ill\\_injure/](http://kidshealth.org/kid/ill_injure/)

<http://www.foodsafety.gov/poisoning/>

<http://kidshealth.org/kid/watch/#cat115>

<http://www.cdc.gov/foodsafety/diseases/>

<http://www.eatright.org/resources/homefoodsafety>

<http://www.eatright.org/resource/homefoodsafety/four-steps/separate/cross-contamination>