**The Great Computer Challenge, 2021**

***Desktop Presentations, Level 2***

# **Background**

Plastic products are accumulating in oceans, forests, and landfills at an alarming rate, harming both wildlife and human populations. Plastic in soil, waterways and the oceans pose a major cleanup problem. Tiny pieces known as microplastics that cannot be seen with the eye alone, endanger our fresh water and food supplies. Plastic pollution is a global challenge and will take a global effort to solve.

# **Guidelines & Requirements**

1. The presentation must contain a *minimum of five (5) slides*.

2. At least one slide must provide *general information* about plastic pollution.

3. At least one slide must identify *in list format* the harmful effects of plastic pollution.

4. At least one slide must include *a picture, diagram, or drawing*.

5. At least one slide must include a *graph, chart or table* with numerical information about plastic pollution.

When creating your slides try to utilize as many of the software’s key features as possible. Design slides with layouts and color schemes that are visually appealing. Choose text types, size, and colors that most clearly display the information. You may use clip art, drawings, audio, or video clips on any of the slides.

**Important:** Presentations must be created in either Microsoft Power Point or Google Slides and saved in the pptx file format. Please observe cross-platform best practices of using (a) image file formats of gif, png, and jpg; (b) audio file formats of mp3, m4a, mp4, and wav; (c) video file formats of mp4, m4v, mpg, and mpeg.

# **Challenge**

Your team’s challenge is to design an exciting and informative presentation to create widespread awareness of the harmful effects of plastic pollution, communicating both the seriousness of this growing crisis and offering possible solutions. It is most important that slide content, pictures, charts, and lists effectively communicate your points to the reader.

To help you with your presentation, information about the causes and effects of plastic in the environment is included on the following pages. You may also conduct and organize your own research. It is proper to footnote the source of any direct quotations used in your slide content.

# **Judging Criteria**

1. The presentation meets all 5 requirements.
2. Information is accurate, organized and clearly displayed.
3. Pictures, charts, drawings, and lists provide effective communication.
4. Slides layouts are visually appealing.

# **SOL Correlation**

Mathematics Standards of Learning for Virginia Public Schools – September 2016

* The student will identify, describe, create, and extend patterns found in objects, pictures, numbers and tables.
* The student will collect, organize, and represent data in bar graphs and line graphs.

English Standards of Learning for Virginia Public Schools – January 2017

The student will demonstrate comprehension of information resources to research a topic and complete a research product.

(a) Construct questions about the topic.

(b) Access appropriate resources.

(c) Collect and organize information about the topic.

(d) Evaluate the relevance of the information.

(e) Avoid plagiarism and use your own words.

(f) Demonstrate ethical use of the Internet.

*Have fun and thanks for participating in the Great Computer Challenge, 2021.*

Plastic Pollution Reference Information

Source:  National Geographic Society

<https://www.nationalgeographic.com/environment/article/plastic-pollution>

Plastic pollution has become one of the most [pressing environmental issues](https://www.nationalgeographic.com/magazine/article/plastic-planet-waste-pollution-trash-crisis), as rapidly increasing production of disposable plastic products overwhelms the world’s ability to deal with them.

The conveniences plastics offer, however, led to a throw-away culture that reveals the material’s dark side: today, single-use plastics account for 40 percent of the plastic produced every year.

Many of these products, such as [plastic bags](https://www.nationalgeographic.com/environment/article/plastic-bag-bans-kenya-to-us-reduce-pollution) and food wrappers, have a lifespan of mere minutes to hours, yet they may persist in the environment for hundreds of years.

Half of all plastics ever manufactured have been made in the last 15 years.

Production increased exponentially, from 2.3 million tons in 1950 to 448 million tons by 2015.

Production is expected to double by 2050.

Every year, about 8 million tons of plastic waste escapes into the oceans from coastal nations. That’s the equivalent of setting five garbage bags full of trash on every foot of coastline around the world.

Plastics often contain additives making them stronger, more flexible, and durable. But many of these additives can extend the life of products if they become litter, with some estimates ranging to at least 400 years to break down.

Most of the plastic trash in the oceans, Earth’s last sink, flows from land.

Trash is also carried to sea by [major rivers](https://www.nature.com/articles/ncomms15611), which act as conveyor belts, picking up more and more trash as they move downstream.

Once at sea, much of the plastic trash remains in coastal waters. But once caught up in ocean currents, it can be transported around the world.

Millions of animals are killed by plastics every year, from birds to fish to other marine organisms. Nearly 700 species, including endangered ones, are known to have been affected by plastics. Nearly every species of seabird eats plastics. Plastics have been consumed by land-based animals, including elephants, hyenas, zebras, tigers, camels, cattle, and other large mammals, in some cases [causing death](https://www.nationalgeographic.com/environment/article/kerala-india-hindu-temples-go-plastic-free).

Once at sea, sunlight, wind, and wave action break down plastic waste into small particles, often less than one-fifth of an inch across. These so-called microplastics are spread throughout the water column and have been found in every corner of the globe.

Microplastics are breaking down further into smaller and smaller pieces. Plastic microfibers, meanwhile, have been found in municipal drinking water systems and drifting through the [air.](https://www.nationalgeographic.com/environment/article/microplastics-pollution-falls-from-air-even-mountains)

Microplastics have been [found](https://www.nationalgeographic.com/magazine/article/plastic-planet-health-pollution-waste-microplastics)in more than 100 aquatic species, including fish, shrimp, and mussels destined for our dinner plates.

Once in the ocean, it is difficult—if not impossible—to retrieve plastic waste. Mechanical systems can be effective at picking up large pieces of plastic, such as foam cups and food containers, from inland waters. But once plastics break down into microplastics and drift throughout the water column in the open ocean, they are virtually impossible to recover.

The solution is to prevent plastic waste from entering rivers and seas in the first place, many scientists and conservationists, including the [National Geographic Society](https://news.nationalgeographic.com/2017/02/mr-trash-wheels-professor-trash-wheels-baltimore-harbor-ocean-trash-pickup/) say. This could be accomplished with improved waste management systems and [recycling](https://www.nationalgeographic.com/environment/article/5-recycling-myths-busted-plastic), better product design that takes into account the short life of disposable packaging, and reduction in manufacturing of unnecessary single-use plastics.

Source: Center for Biological Diversity. "Ocean Plastics Pollution."

<https://www.biologicaldiversity.org/campaigns/ocean_plastics/>

Billions of pounds of plastic can be found in swirling convergences that make up about 40 percent of the world's ocean surfaces.

At current rates plastic is expected to outweigh all the fish in the sea by 2050.

Thousands of seabirds and sea turtles, seals and other marine mammals are killed each year after ingesting plastic or getting entangled in it.

Every year, billions of pounds of *more* plastic end up in the world's oceans. Studies estimate there are now 15–51 trillionpieces of plastic in the world's oceans.

Plastic is so durable that the Environmental Protection Agency reports “every bit of plastic ever made still exists.”

Fish in the North Pacific ingest 12,000 to 24,000 tons of plastic each year, and transfers plastic up the food chain to bigger fish, marine mammals and human seafood eaters.

Hundreds of thousands of seabirds ingest plastic every year. Plastic ingestion reduces the storage volume of the stomach, causing starvation. It’s estimated that 60 percent of all seabird species have eaten pieces of plastic, with that number predicted to increase to 99 percent by 2050.

Marine mammals ingest, and get tangled up in, plastic.

The Center for Biological Diversity has petitioned the U.S. Environmental Protection Agency asking the government to regulate plastics as a pollutant under the Clean Water Act and will keep pushing for plastic pollution to be treated as the hazardous waste that it is.

Source:  Wikimedia Foundation, Inc.,

<https://en.wikipedia.org/wiki/Plastic_pollution>

Plastic pollution is the accumulation of [plastic](https://en.wikipedia.org/wiki/Plastic) objects and particles (e.g. [plastic bottles](https://en.wikipedia.org/wiki/Plastic_bottle), [bags](https://en.wikipedia.org/wiki/Plastic_shopping_bag) and [microbeads](https://en.wikipedia.org/wiki/Microbead)) in the Earth's [environment](https://en.wikipedia.org/wiki/Environment_%28biophysical%29) that adversely affects [wildlife](https://en.wikipedia.org/wiki/Wildlife), [wildlife habitat](https://en.wikipedia.org/wiki/Wildlife_habitat), and [humans](https://en.wikipedia.org/wiki/Pollution#Human_health).

Plastics that act as [pollutants](https://en.wikipedia.org/wiki/Pollutant) are categorized into micro-, meso-, or macro debris, based on size.

The chemical structure of most plastics renders them resistant to many natural processes of [degradation](https://en.wikipedia.org/wiki/Environmental_degradation) and as a result they are slow to degrade. Together, these two factors have led to a high prominence of plastic [pollution](https://en.wikipedia.org/wiki/Pollution) in the environment.

Plastic pollution can afflict land, waterways and oceans. It is estimated that 1.1 to 8.8 million [tons](https://en.wikipedia.org/wiki/Tonne) of plastic waste enters the ocean from coastal communities each year.

It is estimated that there is a stock of 86 million tons of plastic marine debris in the worldwide ocean as of the end of 2013, with an assumption that 1.4% of global plastics produced from 1950 to 2013 has entered the ocean and has accumulated there.

Living organisms, particularly [marine animals](https://en.wikipedia.org/wiki/Marine_animals), can be harmed either by mechanical effects, such as entanglement in plastic objects, problems related to ingestion of plastic waste, or through exposure to chemicals within plastics that interfere with their physiology. Effects on humans include disruption of various [hormonal](https://en.wikipedia.org/wiki/Hormone) mechanisms.

As of 2018, about 380 million tons of plastic is produced worldwide each year. From the 1950s up to 2018, an estimated 6.3 billion tons of plastic has been produced worldwide, of which an estimated 9% has been recycled and another 12% has been incinerated. This large amount of plastic waste enters the environment, with studies suggesting that the bodies of 90% of seabirds contain plastic debris.

In some areas there have been significant efforts to reduce the prominence of free range plastic pollution, through reducing plastic consumption, [litter cleanup](https://en.wikipedia.org/wiki/Litter), and promoting [plastic recycling](https://en.wikipedia.org/wiki/Plastic_recycling).

As of 2020, the global mass of produced plastic exceeds the [biomass](https://en.wikipedia.org/wiki/Biomass_%28ecology%29) of all land and marine animals combined.

Some researchers suggest that by 2050 there could be more plastic than fish in the oceans by weight.

Solutions to Plastic Pollution

Oceanic Society <https://www.oceanicsociety.org/blog/1720/7-ways-to-reduce-ocean-plastic-pollution-today>

American Chemistry Council, Inc. <https://www.reuseplastics.org/news/no-longer-lost-at-sea>

Food Tank <https://foodtank.com/news/2020/08/6-easy-ways-to-stop-plastic-waste-today/>

Glo.be <https://www.glo-be.be/en/articles/14-tips-prevent-plastic-pollution>

EARTHDAY.ORG <https://www.earthday.org/what-you-can-do-to-end-plastic-pollution/>