Задание подготовлено в рамках проекта АНО «Лаборатория модернизации образовательных ресурсов» «Кадровый и учебно-методический ресурс формирования общих компетенций обучающихся по программам СПО», который реализуется с использованием гранта Президента Российской Федерации на развитие гражданского общества, предоставленного Фондом президентских грантов.

*Разработчик*: Кулиш Владимир Александрович, ГБПОУ СО «Нефтегорский государственный техникум»

*Курс*: Иностранный язык

*Тема*: Английский в электрике

Ознакомьтесь с перечнем терминов, необходимых для выполнения задания. Прочитайте текст «Optical instruments» и ответьте на вопросы.

**Запишите ответы в бланк.**

Read the terms that are required to complete the task. Read the text «Optical instruments» and answer the questions.

**Write the answers in the form.**

1. What do optical instruments use to modify light rays?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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2. What kinds of images can be formed by mirrors and lenses?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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3. What influences the amount of bending?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**List of Terms**

angle of incidence – угол падения

concave mirror – вогнутое зеркало

converging – схождение

convex eyepiece lens – выпуклая линза окуляра

far-off objects – отделенные объекты

focal length – фокусное расстояние

grating – решётка

magnifier – увеличитель

refractive index – показатель (индекс) преломления

refractor – рефрактор (телескоп)

screen – экран

**Optical Instruments**

An optical instrument uses mirrors, lenses, prisms or gratings, singly or in combination, to reflect, refract or otherwise modify light rays. Optical instruments, microscopes and telescopes in particular, have probably broadened a man’s intellectual horizons more than any other devices he has made. Perhaps the best way to understand the operation of optical instruments is by geometrical optics- a method that deals with light as rays instead of waves or particles. These rays follow the laws of reflection and refraction as well as the laws of geometry.

**Images** formed by mirrors and lenses may be either real or virtual and of a predictable size and location. A real image, as formed by a camera or projector, is an actual converging of light rays and can be caught on a screen; virtual images cannot. The rays from object points do not pass through corresponding points of a virtual image. Images seen in binoculars are virtual.

**Optical prisms** are transparent solids of glass or other material whose opposite faces are plane but not necessarily parallel. They are used to bend light rays by refraction or internal reflection. The amount of bending depends on the refractive index of the prism, the angle between its faces, and the angle of incidence of the light. Since the refractive index depends also on the wavelength, prisms are often used to disperse a light beam into its spectrum.

**Lenses** form an image by refracting the light rays from an object. Curved glass lenses were first used as simple magnifiers in the 13th century, but it was not till nearly 1600 that the microscope was devised, followed by the telescope a decade or so later. Mirrors, which form an image by reflecting light rays, had already been known for several centuries and were easier to understand. A lens, however, has an advantage over a mirror as it permits the observer to be on the opposite side from the incoming light.

Инструмент проверки

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| 1. An optical instrument uses mirrors, lenses, prisms or gratings, singly or in combination, to reflect, refract or otherwise modify light rays | 1 балл |
| 2. Imagesformed by mirrors and lenses can be either real or virtual and of a predictable size and location | 1 балл |
| 3. The amount of bending depends on the refractive index of the prism, the angle between its faces, and the angle of incidence of the light | 1 балл |
| ***Максимальный балл*** | ***3 балла*** |