*Introduction to Pneumatics (teacher version)*

**Pneumatics**

Pneumatic systems use the energy stored in compressed air to do work. By controlling the release of air into the system, we can turn that energy into controlled movement.

*- Source: http://www.bbc.co.uk/schools/gcsebitesize/design/systemscontrol/pneumaticsrev1.shtml*

 **Task 1 PARTS OF A PNEUMATIC SYSTEM**

**Write down the English terms for the pneumatic parts described below.**

|  |  |
| --- | --- |
|  | ***Parts*** |
| 1. a machine that extracts air from the atmosphere and compresses it into a holding chamber
 | kompresor***air compressor*** |
| 1. the main storage area for compressed air
 | glavni rezervoar***main tank*** |
| 1. a device that regulates the air flow into the rest of the system
 | regulator***regulator*** |
| 1. a connecting part that is shaped like the letter T, used for creating a branch line or splitting a single line in two
 | T povezava***“T” fitting*** |
| 1. a secondary storage area for extra compressed air which ensures that full power is delivered in short intervals
 | dodatni rezervoar***buffer tank*** |
| 1. a piece of piping that moves air around the system
 | dovajalna cev***feeder line (hose)*** |
| 1. a device that can hold the pressure built up on one side and is able to 'pop' completely open so that a pocket of compressed air is rushed out
 | ventil***valve*** |
| 1. a mechanical part which uses the power of compressed gas to produce a force resulting in a linear motion
 | cilinder/valj***cylinder*** |
| 1. the device that generates electricity for the system
 | napajalni vir***power source*** |
| 1. a device used to start or stop the system
 | stikalo***switch*** |

 **Task 2 SIMPLE PNEUMATICS IN ACTION**

1. Watch the video of a simple pneumatic system and then label the parts on the schema below.

|  |  |
| --- | --- |
| **Part** | **Name** |
| 1 | power source |
| 2 | push button |
| 3 | air compressor |
| 4 | regulator |
| 5 | valve |
| 6 | cylinder |
| 7 | claw |

*Link: https://www.youtube.com/watch?v=7O\_9ucZoABY*



1. How much pressure was the regulator set to?

***50 psi (pounds per square inch)***

1. What is output voltage of the power supply?

***12V***

1. How can you adjust the speed at which the claw opens and closes?

***By adjusting the speed at which air enters and leaves the cylinder.***

1. How do you set the default opening and closing speeds?

***You can use the lock rings on either ends of the cylinder to secure the speeds you have set.***

 **Task 3 ADVANTAGES OF PNEUMATICS**

**Write down the advantages of pneumatics that are explained below. For each explanation, your answer should be in the form of a concluding statement.**

1. Pneumatic systems use compressed air. We know already that this is just the air we breathe, forced into small spaces. If a pneumatic system develops a leak, it will be air that escapes and not oil. This makes pneumatics suitable for food production lines.

***CONCLUSION: Pneumatic systems are clean.***

1. We cannot use electronics for applications like paint spraying because many electronic components produce sparks and this could cause the paint to catch fire.

***CONCLUSION: Pneumatic systems are safer than other systems.***

1. Many companies invest in pneumatics because they know they will not have a lot of breakdowns and that the equipment will last for a long time.

***CONCLUSION: Pneumatic systems are more reliable and durable.***

1. Pneumatic components last for a long time, which means they do not need to be replaced too often. Moreover, pneumatics uses air, which is readily available for free around us.

***CONCLUSION: Pneumatic systems are economical.***

1. Once you have bought the basic components, you can set them up to carry out different tasks.

***CONCLUSION: Pneumatic systems are versatile.***

1. Pneumatic systems do not need to be insulated or protected like electronic systems.

***CONCLUSION: Pneumatic systems are more robust and resistant.***

Warm-up video: collage of pneumatics applications

Chair: https://www.youtube.com/watch?v=t-px5k6tM4E

Bus brake: https://www.youtube.com/watch?v=Tf0sk7g6-Wc

Bicycle pump: https://www.youtube.com/watch?v=7teOArtWwsg

Bus door: https://www.youtube.com/watch?v=6\_MGzKXuOIQ

Can crusher: https://www.youtube.com/watch?v=8RH0hXiHS60