Notes: Manufacturing Technical Objects

# What is a technical object?

* An object **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** to **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
  + So, pretty much anything where one or more **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** has been **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** to meet a **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
  + The object must be made from **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
  + It has to be a **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
    - Think hardware not software
* In order to make a technical object, one or more materials need to be **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** to suit the needs of the project
  + This means they will be subjected to **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**and **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

# Mechanical Constraints

Review from earlier years:

**What is a mechanical constraint?**

* A mechanical constraint describes the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** on a material
* There are five types of mechanical constraints:
  + **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
  + **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
  + **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
  + **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
  + **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |  |
| --- | --- | --- |
| **Constraint** | **Force that tends to…** | **Symbol** |
| Compression | crush |  |
|  |  |  |
|  |  |  |
|  |  |  |
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## Practice

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| **Scenario** | **A game of tug o’ war** | **A car getting crushed in a scrap yard** | **A dish cloth being rung out** |
| Type of constraint |  |  |  |
| Symbol |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Scenario** | **Hockey players curving the end of their sticks** | **Ripping a candy wrapper off** | **Swinging on a swing set (*chain*)** |
| Type of constraint |  |  |  |
| Symbol |  |  |  |

# Mechanical Deformations

* A deformation is caused by a material‘s inability to prevent **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** from **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
  + Mechanical constraints **\_\_\_\_\_\_\_\_\_\_\_\_** the deformation
  + As the **\_\_\_\_\_\_\_\_\_\_\_\_\_** applied**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**, the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**
* Three categories of deformations ***(each is more damaging than the previous)***
  + **\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
    - **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**; object goes back to **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** after constraint is removed.
  + **\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
    - **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**; object is **\_\_\_\_\_\_\_\_\_\_\_\_\_\_**after constraint is removed.
  + **\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
    - **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**; object **\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.

## Practice

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| **Scenario** | **Bending a spoon** | **Using a slingshot** | **Smashing a watermelon** |
| Type of deformation |  |  |  |
| Type of constraint |  |  |  |