*****Engineer your Wind Lift to
raise the most pennies possible*.

**

**Before you start…**

Make sure you have built a

**Wind Lift** for use on this challenge.

**Constraints:** (*rules and limits for your design*)

* The **Wind Lift** may be no closer than **60cm** (2ft) from the fan.
* ****A Successful Lift:** The bucket must raise at least **15cm** (6in) in under **20 seconds**.
* Pennies must be lifted in the bucket using *only* the power from the wind.
* You may change the **numbe**r of blades, **angle**, **shape** and **area** of blades.
* The **Wind Lift** tower, string and bucket may not be altered
(*they must be as shown in the* ***Wind Lift*** *Example* ***Build Guide***).
* You may bring in materials for your blades, if the materials are:
	+ ***Teacher Approved***
	+ ***Non-Hazardous*** (no sharp edges, harmful chemicals)
* You will have \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to complete the challenge.

Fill in how much
time you have

60cm (2ft)

**Challenge Supplies:**

**Wind Lift**, material for blades
(*cardboard, recycled packaging, paper*), tape,
ruler, scissors, Philips screw driver, ~100 pennies,
*Engineering Notebook* pages, stopwatch.

**The Engineering Design Process:**

You will be using the **Engineering Design Process**. What does that mean? Your design is never finished; it can always be improved. There is no such thing as a perfect design. Fill out a new *Engineering Notebook* page each time you design/redesign your **Wind Lift**.

Class: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
Set: \_\_\_\_\_\_\_\_\_\_\_\_\_

Record the number of pennies each design was able to lift.

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| Group Name | Design#1 | Design#2 | Design#3 | Design#4 | Design#5 | Design#6 | Design#7 | Design#8 | Design#9 | Design #10 |
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*****Engineer your Wind Lift to raise
10 pennies as fast as possible*.

**Before you start…**
Make sure you have built a
**Wind Lift** for use on this challenge.

**Constraints:** (*rules and limits for your design*)

* The **Wind Lift** may be no closer than **60cm** (2ft) from the fan.
* **Lift Time:** The **amount of time** it takes to raise ten pennies **20cm** (8in).
* Pennies must be lifted in the bucket using only the power from the wind.
* You may change the **number** of blades, **angle**, **shape** and **area** of blades.
* The **Wind Lift** tower, string and bucket may not be altered
(*they must be as shown in the* ***Wind Lift*** *Example* ***Build Guide***).
* You may bring in materials for your blades, if the materials are:
	+ ***Teacher Approved***
	+ ***Non-Hazardous*** (no sharp edges, harmful chemicals)
* You will have \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to complete the challenge.

Fill in how much
time you have

60cm (2ft)

**Challenge Supplies:**
**Wind Lift**, material for blades
(*cardboard, recycled packaging, paper*), tape,
ruler, scissors, Philips screw driver, ~100 pennies,
*Engineering Notebook* pages, stopwatch.

**The Engineering Design Process:**

You will be using the **Engineering Design Process**. What does that mean? Your design is never finished; it can always be improved. There is no such thing as a perfect design. Fill out a new *Engineering Notebook* page each time you design/redesign your **Wind Lift**.

Class: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
Set: \_\_\_\_\_\_\_\_\_\_\_\_\_

Record the time each design took to lift 10 pennies.

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| Group Name | Design#1 | Design#2 | Design#3 | Design#4 | Design#5 | Design#6 | Design#7 | Design#8 | Design#9 | Design #10 |
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