Unit Conversion (Metric System)

**Objectives:**

* + Convert distance values from one unit of measure to another (mm, cm, m, km)
  + Convert weight values from one unit of measure to another (mg, g, kg)
  + Convert area and volume values from one unit of measure to another (mm2/ mm3, cm2/cm3, m2/m3, km2/km3; ml and l)
  + Convert time values from one unit of measure to another (sec, min, hr)

**Before We Begin:**

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| --- | --- | --- |
| Terms | Units | Methods |
| * + Units   + Distance   + Weight   + Volume   + Time | * + mm, cm, m, km   + mg, g, kg   + mm2, cm2, km2   + mm3, cm3, km3   + ml, l   + sec, min, hr | * + Convert a fraction to decimal   + Simplify a fraction   + Multiply by powers of 10   + Divide by powers of 10 |

**Lesson Plan: (Chapter 13 IGCSE Textbook - Understanding units, Time)**

|  |  |  |  |
| --- | --- | --- | --- |
| Content | Teacher's Activity | Student's Activity | Assignments |
| Distance | * + Explain how there are different units for measurement and we will be focusing on the SI or MKS system   + Point out the relationship between mm, cm, m and km, using examples to convert from one unit to another | * + Understand that the units get smaller from km->m->cm->mm and hence the numbers get bigger as we convert from km->m->cm->mm   + Convert units across: km, m, cm and mm | Examples and problems from the IGCSE textbook |
| Weight | * + Point out the relationship between mg, g and kg, using examples to convert from one unit to another | * + Understand that the units get smaller from kg->g->mg and hence the numbers get bigger as we convert from kg->g->mg   + Convert units across: kg, g and mg | Examples and problems from the IGCSE textbook |
| Area and Volume | * + Discuss the meaning of area and volume and their use in our daily lives   + Point out the relationship between km->km2, mm->mm2 and cm->cm2 using examples   + Point out the relationship between km->km3, mm->mm3 and cm->cm3 using examples   + Point out that volume can also be measured in ml and l | * + Understand that there is a significant difference between a unit, square unit and cubic unit   + Calculate area and volume for simple figures and convert across mm2, cm2 and km2; mm3, cm3 and km3 | Examples and problems from the IGCSE textbook |
| Time | * + Discuss the history of time - why is it multiples of 60 instead of 10?   + Point out the relationship between sec, min and hr, using examples to convert from one unit to another | * + Convert time from 24 hr format to 12 hr format and vice versa   + Convert units across: hr, min and sec   + Calculate the time difference between given times | Examples and problems from the IGCSE textbook |
| Activity | * + Point out the real-world use cases of unit conversion through an activity | * + Understand the real-world use cases of unit conversion through the activity |  |
| Self-assessment and Test |  |  | Shorter test with self-correction in class |

**Why do we need to learn about Unit Conversion?**

Activity on calculating flight schedule, carry-on and check-in luggage limits for a passenger aeroplane company.

**Self-Assessment:**

|  |  |  |  |
| --- | --- | --- | --- |
| Topic | Understanding of the topic | Working with simple cases | High comfort-level and confidence with the topic |
| Distance | * + I know the meaning of unit   + I know the commonly used units for distance | * + I can convert values across the following units: mm, cm, m, km   e.g 21m = 2100cm = 0.021km | * + I can solve real-life examples where distances need to be converted from one unit to another   e.g. converting speed from m/s to km/hr |
| Weight | * + I know the commonly used units for weight | * + I can convert values across the following units: mg, g, kg   e.g 50g = 50000mg = 0.05kg | * + I can solve real-life examples where weights need to be converted from one unit to another   e.g. calculating allowed baggage in an aircraft using allowed weight and bag weight |
| Area and Volume | * + I know the commonly used units for area and volume | * + I can convert values across the following units for area: mm2, cm2, m2, km2   e.g 2km2 = 2 x 106 m2   * + I can convert values across the following units for volume: ml, l, mm3, cm3, m3, km3   e.g. 1m3 = 1000l = 106ml = 106cm3 | * + I can solve real-life examples where area and volume need to be converted from one unit to another   e.g. calculating allowed baggage in an aircraft using available volume and luggage volume |
| Time | * + I know the commonly used units for time | * + I can convert values across the following units: sec, min, hr   e.g 3600 sec = 60 min = 1hr | * + I can calculate the time difference between two given times across days   e.g. time difference between 15:30 on Tue and 6:30 on Wed |