

Title: Octal (72) to Decimal and Back Conversion

Description: In this activity, students will learn how to convert an **Octal number (base-8)** to a **Decimal number (base-10)**, and then convert it back to **Octal**, step by step. This will help students understand how base-8 systems work and how each position has its own value based on powers of 8.

Purpose: To help students:

- Understand how Octal numbers are structured.
- Learn to convert Octal numbers to Decimal using positional values.
- Practice reverse conversion from Decimal to Octal using division method.
- Strengthen number system understanding with practical examples.

Part A: Convert Octal 72 to Decimal

Steps:

1. Write down the Octal number:

7 2

2. Assign powers of 8 from right to left (starting at 0):

8¹ 8⁰

Which equals:

8 0

3. Multiply each Octal digit by its power of 8. Also add them:

Step-by-Step Explanation (with Visual Aid):

Octal Digits:	7	2
	↓	↓
Powers of 8:	8 ¹	8 ⁰
	↓	↓
Multiplication:	7×8	2×1
	↓	↓
Results:	56	+ 2 = 58

✓ So, Octal 72 = Decimal 58

Part B: Convert Decimal 58 to Octal

Steps:

1. **Take the decimal number: 58**
2. **Divide the number by 8** and record the **remainder**.
3. **Repeat** until the quotient is 0.
4. **Read the remainder in reverse order (bottom to up).**

Step-by-Step Explanation (with visual Aid):

Division Step	Quotient	Remainder
$58 \div 8$	7	2
$7 \div 8$	0	7

👉 Write the remainders **from bottom to top**: 7 2

✅ So, Decimal 58 = Octal 72

Conclusion:

- ✓ This proves that octal and decimal conversions are reversible when done correctly.
- ✓ This activity helps reinforce the importance of **place value in base-8** and **division-based reverse conversion**.