

### **Enduring Understanding**

Other number bases and operational systems are useful.

### **Essential Questions**

How is modular arithmetic used?

How are place value concepts used to compute and convert between number systems with different bases?

Under what operations is a finite system a group?

### **Indicators**

- 6.IM.5.8 connect operations in modular arithmetic to operations in the real number system.
- 6.IM.6.5 connect properties in modular arithmetic to properties in the real number system.
- 6.IM.5.7 create addition and multiplication tables for various finite modular systems.  
( $2 \leq \text{mod} \leq 12$ )
- 6.IM.6.4 identify and justify properties for modular systems under addition and multiplication, including closure.
- 6.IM.5.6 compute in and convert between numbers systems with different bases, including the base two (binary) number system.
- 6.IM.3.1 recognize and describe applications of number systems with different bases.
- 6.IM.6.6 analyze modular systems for group properties with respect to addition and multiplication.
- 6.IM.6.7 analyze modular systems for group properties with respect to subtraction and division.