$$\boxed{\text{Instructions}}$$

As a group, prove your group's **Exercise** (i.e., **ER**) on the corresponding AWW board.

(1) Congruence Exercise/Group 1.   PINs: 301, 304, 305, 308, 317, 322, 323, 325, 329, 330,
(2) Congruence Exercise/Group 2.   PINs: 303, 307, 310, 312, 313, 314, 319, 324, 331
(3) Congruence Exercise/Group 3.   PINs: 302, 306, 309, 311, 315, 316, 318, 320, 321

Be sure to follow the Writing Guidelines.

$$\boxed{\text{Group 1}}$$

ER1. Let $n \in \mathbb{N}$ and $a_1, a_2, b_1, b_2 \in \mathbb{Z}$. Let

$$a_1 \equiv a_2 \ (\text{mod n})$$

and

$$b_1 \equiv b_2 \ (\text{mod n}).$$

Then $a_1 + b_1 \equiv a_2 + b_2 \ (\text{mod n})$.

$$\boxed{\text{Group 2}}$$

ER2. Let $n \in \mathbb{N}$ and $a_1, a_2, b_1, b_2 \in \mathbb{Z}$. Let

$$a_1 \equiv a_2 \ (\text{mod n})$$

and

$$b_1 \equiv b_2 \ (\text{mod n}).$$

Then $a_1 \cdot b_1 \equiv a_2 \cdot b_2 \ (\text{mod n})$.

$$\boxed{\text{Group 3}}$$

ER3. Let $n \in \mathbb{N}$ and $a, b, c \in \mathbb{Z}$. If $a \equiv b \ (\text{mod n})$ and $b \equiv c \ (\text{mod n})$, then $a \equiv c \ (\text{mod n})$. (transitive)