In this activity, you will classify wallpaper patterns. Mathematically speaking, *wallpaper patterns* are patterns that extend forever in both the horizontal and the vertical direction. Although infinitely many different wallpaper designs are possible, mathematicians have shown that there are exactly 17 different types of wallpaper patterns if they are classified by their symmetries. Each type of pattern has a code that is made up of two to four characters. Use the flow chart on this page to identify types and assign codes to the patterns on the next page.

**Wallpaper-Pattern Classification Flow Chart**

```
Is there a reflection?

180°

Yes

- Is there a glide reflection in a line that is not a reflection line?
  - Yes
    - cm
  - No
    - pm

No

- Is there a glide reflection?
  - Yes
    - pg
  - No
    - p1

120°

Yes

- Are there reflections in two directions?
  - Yes
    - pgg
  - No
    - p2

No

- Is there a glide reflection?
  - Yes
    - pgg
  - No
    - p2

90°

Yes

- Are there reflections in four directions?
  - Yes
    - p4m
  - No
    - p4g

No

- Is there a reflection?
  - Yes
    - p4m
  - No
    - p4g

60°

Yes

- Are there reflections in six directions?
  - Yes
    - p6m
  - No
    - p6

No

- Is there a reflection?
  - Yes
    - p6m
  - No
    - p6
```

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Activity 9 (continued)

Q1 Code: ____________

Chinese design

Q2 Code: ____________

Moorish design

Q3 Code: ____________

Arabian design

Q4 Code: ____________

Assyrian design

Q5 Code: ____________

Japanese design

Q6 Code: ____________

Indian design

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