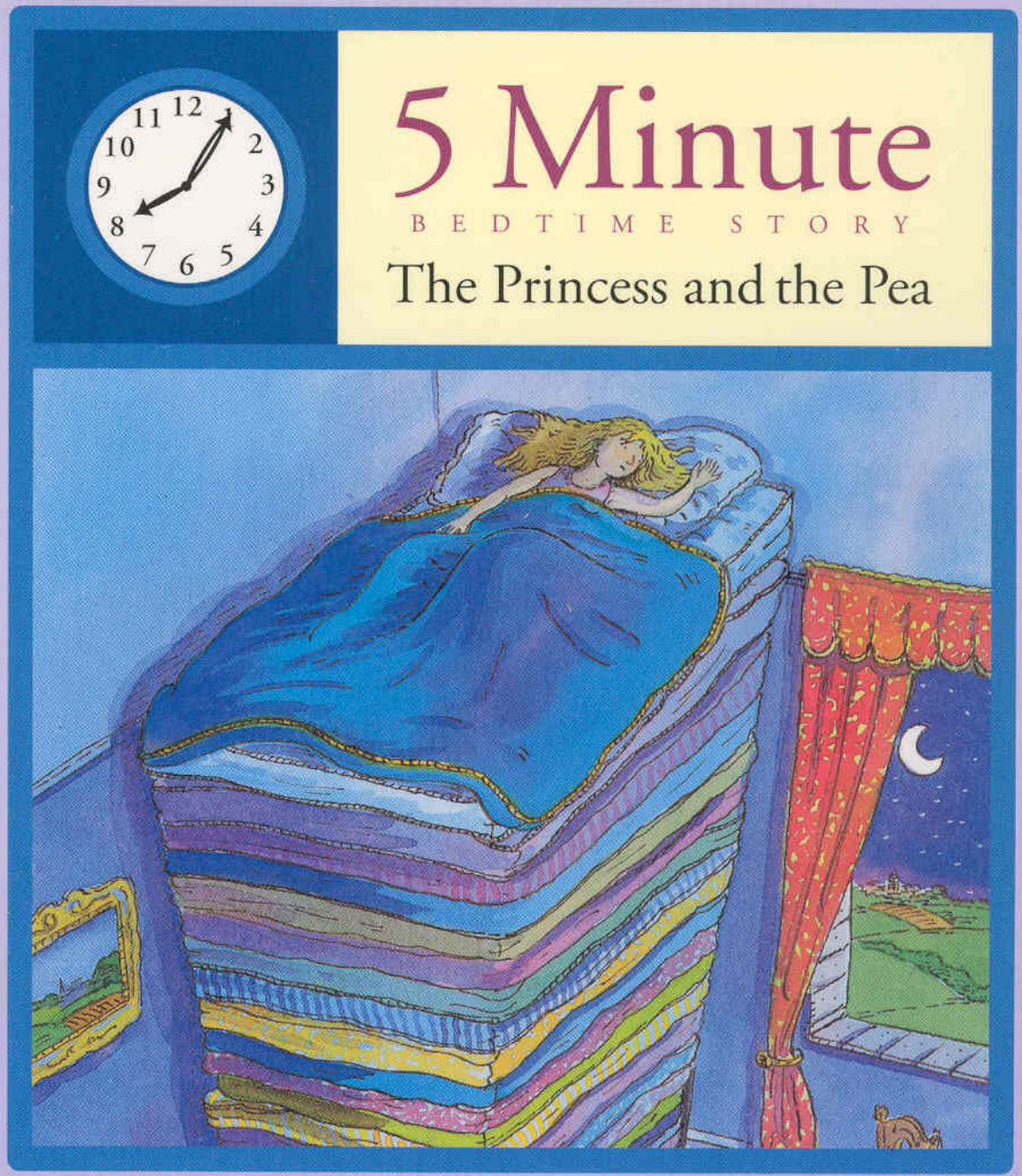
5 Minute
BEDTIME STORY
The Princess and the Pea

The queen was not convinced that the young lady was truly a princess. To find out, she devised a clever test.

The servants piled twenty mattresses, one on top of the other. Then they put twenty fine quilts, one over the other, on top of the twenty mattresses. So soft and lush was the bed that any ordinary person would sleep forever. But then the queen placed a small uncooked pea under the bottom mattress.

"If she is a princess, she'll get no comfort out of this bed. For only the delicate nature of a true princess will be able to feel the pea under all these layers," said the queen.

3.14.4

a. $\forall\ x \in A,\ P(x) \wedge \sim Q(x)$
b. $\forall\ x \in A,\ x \in B$
c. $\forall\ x \in B,\ \sim Q(x) \rightarrow R(x)$
d. $\therefore \forall\ x \in A,\ R(x)$

3.14.5

a. $\forall\ x \in A,\ x \in B$

b. $\forall\ x \in B,\ \sim P(x)$

c. $\forall\ x \in A,\ Q(x) \rightarrow P(x)$

d. $\therefore \forall\ x \in A,\ \sim Q(x)$

3.14.10

a. $\forall\ x \in A,\ \exists\ y \in B \mid P(x, y)$

b. $\forall\ y \in B,\ Q(y) \vee R(y)$

c. $\forall\ x \in A,\ y \in B,\ P(x, y) \rightarrow \sim Q(y)$

d. $\exists\ x \in A \mid S(x)$

e. $\therefore \exists\ y \in B \mid R(y)$

3.14.11

a. $\forall\, x \in A,\ x \in B \wedge x \in C$
b. $\forall\, x \in C,\ x \in D \vee x \in E$
c. $\forall\, x \in B,\ x \in D \rightarrow P(x)$
d. $\forall\, x \in B,\ x \in E \rightarrow Q(x)$
e. $\forall\, x \in B,\ P(x) \vee Q(x) \rightarrow R(x)$
f. $\therefore \forall\, x \in A, R(x)$