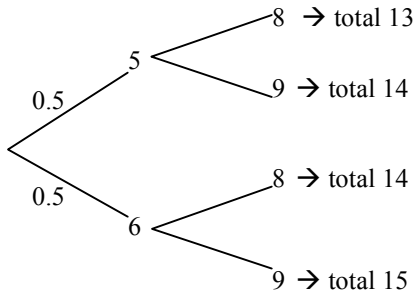
Assessment Schedule – 2006

Mathematics: Determine probabilities (90194)

Evidence Statement

<table>
<tr><th></th><th>Criteria</th><th>No.</th><th>Evidence</th><th>Code</th><th>Judgement</th><th>Sufficiency</th></tr>
<tr><td rowspan="4">Achievement</td><td rowspan="4">Determine probabilities.</td><td>1(a)</td><td>$\frac{100}{175}=\frac{4}{7}=0.571428..=57.1428...\%$</td><td>A</td><td>Or equivalent.</td><td rowspan="4">3 of code A.</td></tr>
<tr><td>1(b)</td><td>$\frac{100}{371}=0.26954...=26.954..\%$</td><td>A</td><td>Or equivalent.</td></tr>
<tr><td>2(a)</td><td>$0.3\times0.3=0.09=9\%$</td><td>A</td><td>Or equivalent.</td></tr>
<tr><td>2(b)</td><td>$2\times0.3\times0.7=0.42=42\%$</td><td>A</td><td>Or equivalent
Accept any correctly rounded / truncated answer.</td></tr>
<tr><td rowspan="3">Achievement with Merit</td><td rowspan="3">Solve probability problems using theoretical methods.</td><td>3(a)</td><td>$\frac{1}{4}\times\frac{4}{5}=\frac{1}{5}=0.2=20\%$</td><td>A / M</td><td>Or equivalent.</td><td rowspan="3">Achievement plus
2 of code M

or
3 of code M.</td></tr>
<tr><td>3(b)</td><td>$\frac{1}{4}\times\frac{1}{5}+\frac{3}{4}\times\frac{4}{5}=\frac{13}{20}=0.65=65\%$</td><td>A / M</td><td>Or equivalent.</td></tr>
<tr><td>3(c)</td><td>$\frac{3}{10}\times\frac{2}{5}+\frac{7}{10}\times\frac{4}{5}=\frac{17}{25}=0.68=68\%$</td><td>A / M</td><td>Or equivalent.

Accept any correctly rounded / truncated answers.</td></tr>
<tr><td>Achievement with Excellence</td><td>Explore probability situations to solve problems.</td><td>4</td><td> 

If there were 3 each of 8 and 9, we would expect the frequencies to be approx 1:2:1. They are not, and the lowest result for total 13 suggests 8 is only on one or two sides. The probabilities for all options are:
<table>
<tr><td>Option (8's & 9's)</td><td>13</td><td>14</td><td>15</td></tr>
<tr><td>1 & 5</td><td>$^{10}/_{120}$</td><td>$^{60}/_{120}$</td><td>$^{50}/_{120}$</td></tr>
<tr><td>2 & 4</td><td>$^{20}/_{120}$</td><td>$^{60}/_{120}$</td><td>$^{40}/_{120}$</td></tr>
<tr><td>3 & 3</td><td>$^{30}/_{120}$</td><td>$^{60}/_{120}$</td><td>$^{30}/_{120}$</td></tr>
<tr><td>4 & 2</td><td>$^{40}/_{120}$</td><td>$^{60}/_{120}$</td><td>$^{20}/_{120}$</td></tr>
<tr><td>5 & 1</td><td>$^{50}/_{120}$</td><td>$^{60}/_{120}$</td><td>$^{10}/_{120}$</td></tr>
<tr><td>actual</td><td>$^{20}/_{120}$</td><td>$^{66}/_{120}$</td><td>$^{34}/_{120}$</td></tr>
</table>
The shaded row in the table most closely matches the experimental probabilities.

Therefore the second die is most likely to have four sides labelled "9".</td><td>A / M

E</td><td>EITHER:
Evidence for one Code A: Diagram drawn to show one possible outcome of rolling these two dice (eg 6&9 giving 15), and the resulting probability.
OR:
Evidence for one Code M: Diagram drawn to show the two possible outcomes of rolling these two dice to give total of 14, and the resulting total probability.

For code E:

Decision is justified using probabilities.</td><td>Merit
plus

Code E.</td></tr>
</table>

Judgement Statement

Mathematics: Determine probabilities (90194)

Achievement	Achievement with Merit	Achievement with Excellence
Determine probabilities. 3 × A	*Solve probability problems using theoretical methods.* Achievement *plus* 2 × M **OR** 3 × M	*Explore probability situations to solve problems.* Merit *plus* 1 × E