

*Comprehension of
Safety Briefing Card
Pictorials and Pictograms:
Presentation Factors*

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Introduction



- **Regulatory requirements for safety briefings and briefing cards**
- **History of pictorial comprehension testing**
 - Test methods
 - Briefing card design
 - NTSB Safety Study: Airline Passenger Safety Education: A Review of Methods Used to Present Safety Information, 1985
 - Briefing card effectiveness
 - NTSB Safety Study: Emergency Evacuation of Commercial Airplanes, 2000

Addressing the current state-of-the-art for airline safety briefing cards

- **Participants**
 - Recruited from a variety of sources
 - 358 (46%) males / 427 females (54%)

Age Categories

Age	Frequency	Percent
15-30 years	566	72.1
31-50 years	167	21.3
51+ years	52	6.6
Total	785	100.0

Education Level Categories

Education	Frequency	Percent
High School Student	341	43.4
High School Diploma	234	29.8
Associate's Degree	94	12.0
Bachelor's Degree	90	11.5
Master's / Doctorate	26	3.3
Total	785	100.0

Cabin Safety Expertise and Commercial Flight History

Expertise	Flight History	Frequency	Percent
Adult Expert	0-2 trips	3	1.9
	3-6 trips	20	12.7
	7-12 trips	16	10.2
	13+ trips	118	75.2
	Total	157	100.0
Adult Non-Expert	0-2 trips	86	53.1
	3-6 trips	39	24.1
	7-12 trips	22	13.6
	13+ trips	15	9.3
	Total	162	100.0
Student Non-Expert	0-2 trips	277	59.4
	3-6 trips	129	27.7
	7-12 trips	43	9.2
	13+ trips	17	3.6
	Total	466	100.0

Correlation Matrix for Participant Demographics

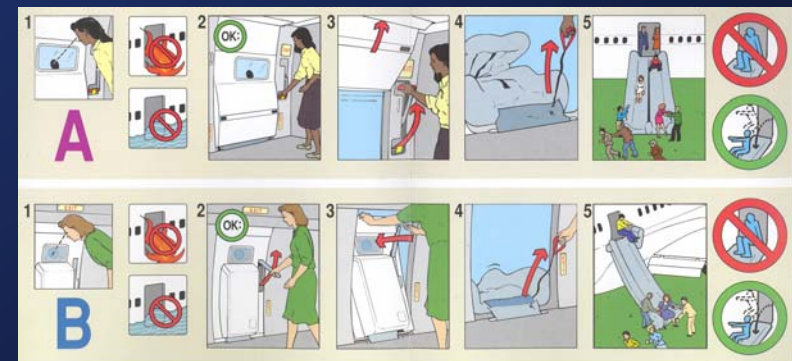
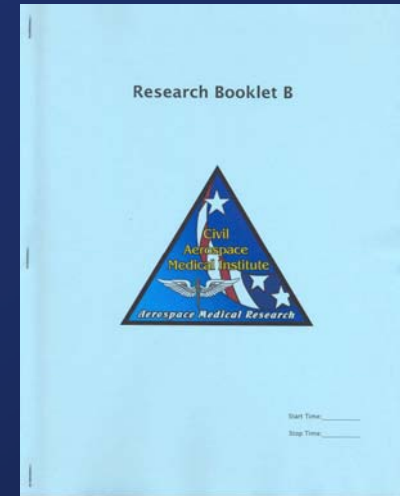
Demographic		Gender	Age	Education	Flights
Individual Age	<i>r</i>	.055			
	<i>p</i>	.122			
	N	785	785		
Education Level	<i>r</i>	.078*	.734**		
	<i>p</i>	.029	.000		
	N	785	785	785	
Number of flights	<i>r</i>	.029	.183**	.189**	
	<i>p</i>	.420	.000	.000	
	N	781	781	781	781
Expertise Level	<i>r</i>	.061	.784**	.750**	.335**
	<i>p</i>	.090	.000	.000	.000
	N	785	785	785	781

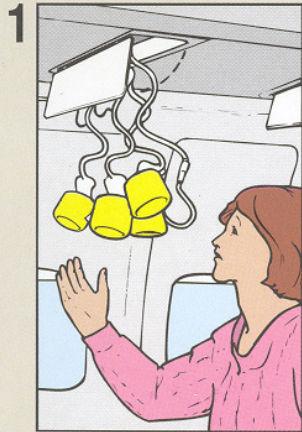
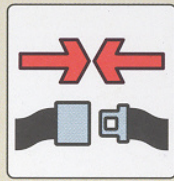
(Pearson *r*; 2-tailed)

Stimulus Materials



- 41 pictorials and pictograms
- 7 ANSI graphical symbols
- 4 graphical exit symbols
- 6 sets of research booklets
 - Consent form
 - Instructions
 - 20 pictorials/pictograms
 - 10 symbols
 - Questionnaire





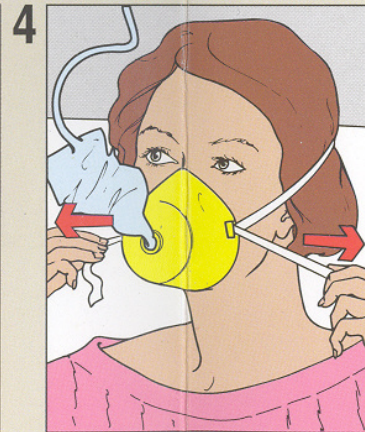
(Sec.) 0:00



0:03



0:05



0:07



0:10

- Fully describe what you think the counter (Sec.) is telling you?

- Why do you think it is important?

Procedure

- Individual or group setting
- Written responses to open-ended, true-false, multiple choice questions
- Instructed not to return to a prior page
- About 30 minutes to complete



Data Reduction and Analysis

- Responses reduced manually and entered into Microsoft Excel[®] spreadsheet
- ANSI Symbols
 - SPSS[®] Text Analysis for Surveys 2.0
 - “Symbol literacy index”
- Pictorials and Pictograms
 - 5 judges established comprehension criteria
 - Response categorization
 - Specific question addressed/not addressed
 - Comprehension estimate (Correctness of answer)
 - For each individual question
 - For overall pictorial/pictogram

Response Categories:

Comprehension Estimate

- “**Certain**” – Response was correct and complete.
- “**Likely**” – Response was mostly correct but missing a key element(s).
- “**Arguable**” – Response contained words or ideas that indicated partial correctness but were ambiguous or unclear.
- “**Suspect**” – Response contained words or ideas that were related but misconstrued.
- “**Opposite**” – Response contained words or ideas that were related but contradictory to the correct response.
- “**Wrong**” – Response was wrong.
- “**None**” – Response was “don’t know.”
- “**Blank**” – No response was given.

Comprehension Scoring

- **Data Transformation for Each Category**

- Frequency of responses
- Convert to percentage
 - Frequency/Total Responses (from all categories except “Blank”) X 100

- Apply weighting algorithm (Percentage X Weight)

- Certain X 1.0
- Likely X 0.75
- Arguable X 0.50
- Suspect X 0.25
- Opposite X -1.0
- Wrong X 0.0

- **Sum to obtain comprehension score (the percentage of total comprehension)**

<i>Response Category</i>	<i>Frequency</i>	<i>Usable %</i>		
Blank	2	0.0%		
None	1	1.2%		
Opposite	0	0.0%	*-1.0	0.0%
Wrong	19	23.2%		
Suspect	4	4.9%	*.25	1.2%
Arguable	12	14.6%	*.50	7.3%
Likely	3	3.7%	*.75	2.7%
Certain	43	52.4%	*1.0	52.4%
			ISO+ Score	63.7%
Usable N=	82			

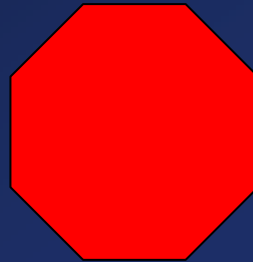
Symbol Comprehension Scores



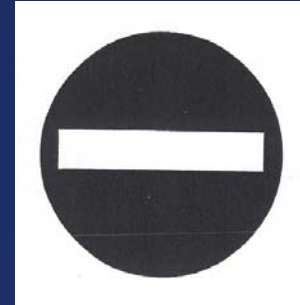
•STDS1



•STDS2



•STDS3



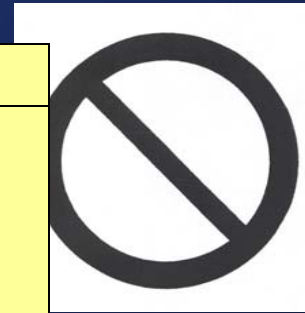
•STDS4



•STDS5



•STDS6



•STDS7

Pictographic Element	Sequence Number	Comprehension Score
Restrooms for men and women	STDS1	93.0
Fire extinguisher	STDS2	97.6
Stop	STDS3	95.2
No entry for vehicle	STDS4	40.5
Biohazard	STDS5	58.7
Safety alert	STDS6	54.3
Prohibited	STDS7	91.8
	Mean	75.9%



- Fully describe what you think this pictogram means.

Comprehension Criterion:
Keep seatbelt fastened at all times
during flight.



Seat Belt (B1) Composite Score

Comprehension Category	Frequency	Percent	Weight	Comprehension Score
Certain	160	62.80	1.00	63.20
Likely	66	26.00	0.75	19.50
Arguable	10	4.30	0.50	1.95
Suspect	14	5.50	0.25	1.38
Opposite	2	0.80	-1.00	-0.80
Wrong	1	0.40	0.00	0.00
Blank	2	-	-	0.00
Total	255	100		85%

Usable analytical n (253) does not include “blank” responses.

Comprehension Criterion: Keep seatbelt fastened at all times during flight.



Comprehension Category

Typical Responses

Certain

While in flight and while seated please ensure your seatbelt is fastened at all times.

Likely

Prepare for turbulence.

Arguable

How you should properly sit on a plane.

Suspect

Safety seat belt.

Opposite

You can unfasten your seatbelt at cruise altitude.

Wrong

Altitude sickness.



- Describe exactly what you think this pictogram means.



Comprehension Criterion: Remain seated and do not unfasten your seatbelt during turbulence.

Seat Belt Usage in Turbulence (T1) Composite Score

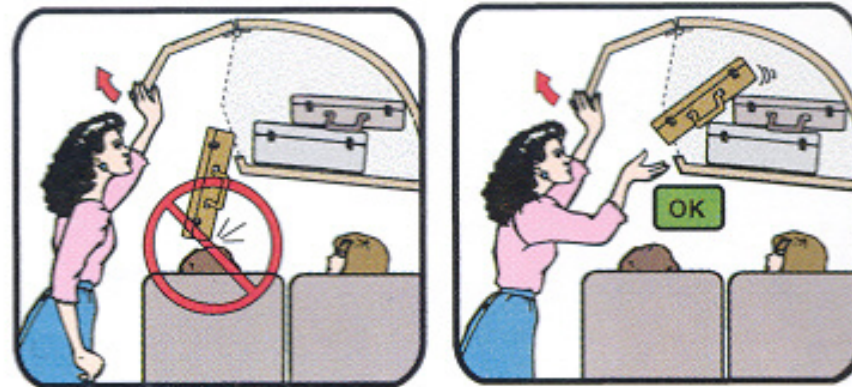
Comprehension Category	Frequency	Percent	Weight	Comprehension Score
Certain	230	58.97	1.00	58.46
Likely	85	21.79	0.75	11.54
Arguable	42	10.77	0.50	6.80
Suspect	22	5.60	0.25	2.44
Opposite	3	0.77	-1.00	-0.77
Wrong	5	1.30	0.00	0.00
None	3	0.77	0.00	0.00
Blank	7	-	-	-
Total	397	100		81%

Usable analytical n (390) does not include “blank” responses.

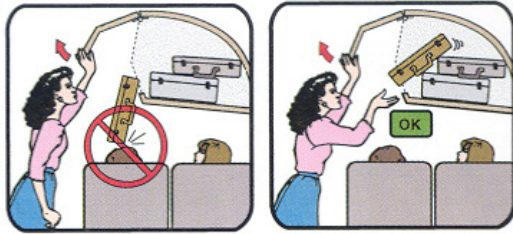


Comprehension Criterion: Remain seated and do not unfasten your seatbelt during turbulence.

Comprehension Category	Typical Responses
Certain	Seatbelts should remain fastened while seated in the event of turbulence.
Likely	Do not unbuckle when plane is in the air.
Arguable	Sit and buckle up the correct way.
Suspect	To buckle or unbuckle lift up or down.
Opposite	It is safe to unbuckle.
Wrong	Open your seatbelt when aircraft is on the water.



- **Fully describe what you think this pictogram means.**

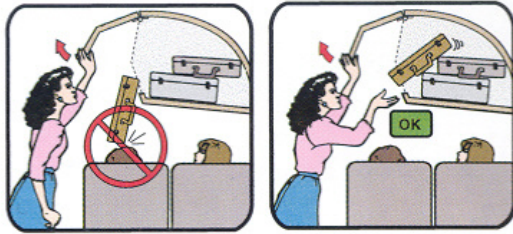


Comprehension Criterion: Be prepared to catch falling items when opening the overhead bin.

Overhead Bin Safety (OB1) Composite Score

Comprehension Category	Frequency	Percent	Weight	Comprehension Score
Certain	66	50.38	1.00	50.38
Likely	27	20.61	0.75	15.46
Arguable	16	12.21	0.50	6.11
Suspect	18	13.74	0.25	3.44
Opposite	2	1.53	-1.00	-1.53
Wrong	2	1.53	0.00	0.00
Blank	1	-	-	-
Total	132	100		74%

Usable analytical n (131) does not include "blank" responses



Comprehension Criterion: **Be prepared to catch falling items** **when opening the overhead bin.**

Comprehension Category

Typical Responses

Certain

Be careful when opening overhead compartments. Make sure that your items don't fall out and injure passengers.

Likely

Be careful opening bin.

Arguable

Push your bag completely into the bin so it doesn't fall out when the door is opened to hit someone.

Suspect

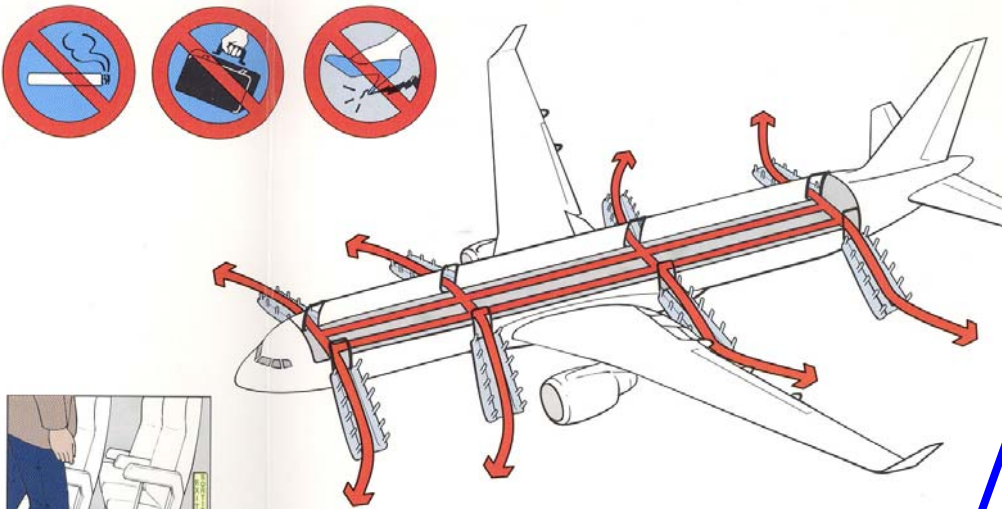
Something about luggage falling.

Opposite

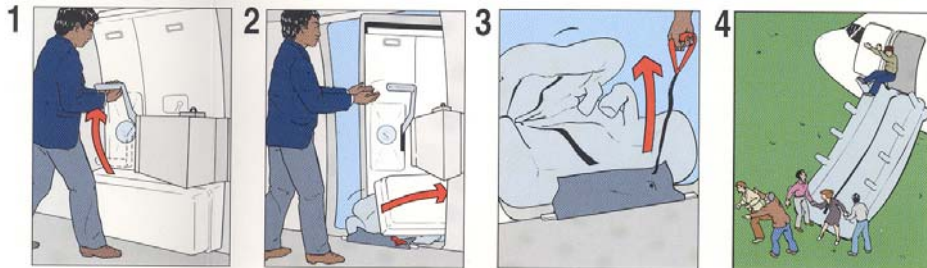
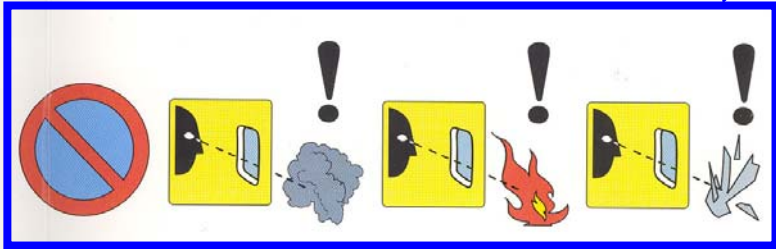
Exactly how to put the suitcase up.

Wrong

Ask the person below where you want to put your bag if it's okay or if it will fit.



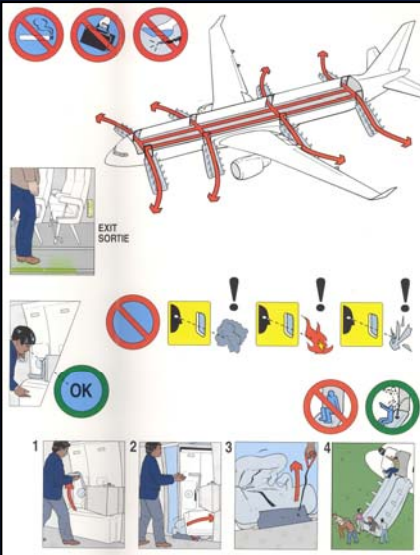
EXIT
SORTIE



- Study this entire pictogram.
- Now, describe exactly what you think this section means.

Comprehension Criterion:

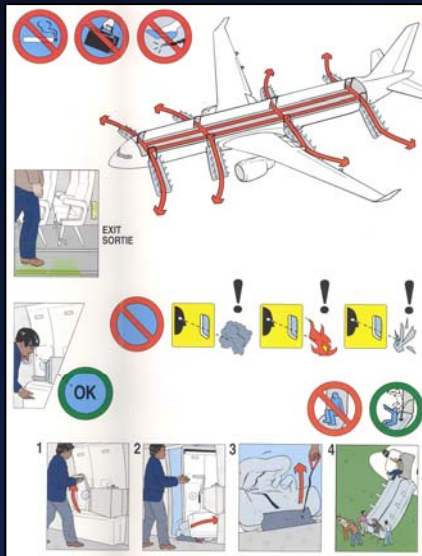
Warning! Look out the window and do not open the door or exit if you see smoke, fire, or dangerous debris .



Warning (W1) Type 1 Composite Score

Comprehension Category	Frequency	Percent	Weight	Comprehension Score
Certain	52	25.49	1.00	25.49
Likely	41	20.10	0.75	13.60
Arguable	27	13.24	0.50	6.12
Suspect	25	12.25	0.25	3.06
Opposite	21	10.29	-1.00	-10.29
Wrong	23	11.27	0.00	0.00
None	16	7.35	0.00	0.00
Blank	8	-	-	-
Total	212	100		38%

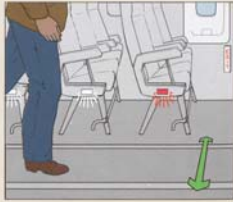
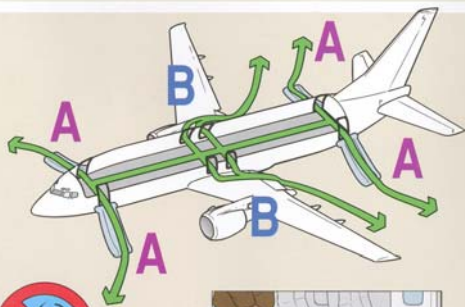
Usable analytical n (204) does not include “blank” responses.



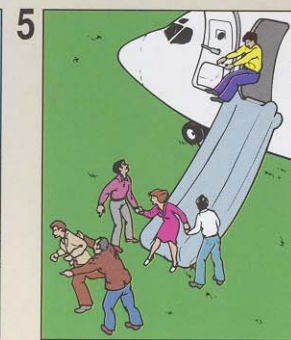
Comprehension Criterion:

Warning! Look out the window and do not open the door or exit if you see smoke, fire, or dangerous debris .

Comprehension Category	Typical Responses
Certain	If you look outside an exit and you see smoke, fire, or debris, do not use the exit.
Likely	Check out the windows at all times to make sure you don't exit to something bad.
Arguable	Watch for smoke, fire, and glass.
Suspect	Telling you what to do in case of fire.
Opposite	Don't look to see smoke, fire, or broken glass.
Wrong	Break glass if fire occurs.



- These two pictograms are presented together on a briefing card. Study them both.
- Why do you think there are separate pictograms for A and B?



A



B



Comprehension Criterion: Pictogram A presents operating instructions for a floor-level exit and pictogram B presents operating instructions for an overwing exit.

Emergency Exits (FLEX2) Composite Score

Comprehension Category	Frequency	Percent	Weight	Comprehension Score
Certain	22	19.47	1.00	19.47
Likely	36	31.86	0.75	23.89
Arguable	29	25.66	0.50	12.83
Suspect	17	15.04	0.25	3.76
Wrong	7	6.19	0.00	0.00
None	2	1.77	0.00	0.00
Blank	1	-	-	-
Total	114	100		60%

Usable analytical n (113) does not include “blank” responses.



Comprehension Criterion:
Pictogram A presents operating instructions for a floor-level exit and pictogram B presents operating instructions for an overwing exit.

Comprehension Category	Typical Responses
Certain	A is giving directions on how to evacuate using the doors. B is giving direction on how to open the over wing exit. They are two different types of exits on the aircraft.
Likely	One shows how to get out on wing the other shows how to get out at other spots.
Arguable	Two different doors.
Suspect	Smaller area of evacuation
Wrong	They are two different wings to the plane.



FOR WATER EVACUATION



- Fully describe what you think segment 4 means.

- Fully describe what you think segment 7 means.



Comprehension Criterion:
Inflate your life vest at or outside the exit as you prepare to board the life raft. Use the knife in the survival kit to cut the line tethering the life raft to the airplane.

Water Evacuation (WE3) Composite Score

Comprehension Category	Frequency	Percent	Weight	Comprehension Score
Certain	31	24.03	1.00	24.03
Likely	46	35.66	0.75	26.75
Arguable	36	27.91	0.50	13.96
Suspect	9	6.98	0.25	1.75
Wrong	5	3.88	0.00	0.00
None	2	1.58	0.00	0.00
Blank	1	-	-	-
Total	130	100		67%

Usable analytical n (129) does not include "blank" responses.



Comprehension Criterion:

Inflate your life vest at or outside the exit as you prepare to board the life raft. Use the knife in the survival kit to cut the line tethering the life raft to the airplane.

Comprehension Category	Typical Segment 3 Responses
Certain	Inflate vest upon exiting aircraft.
Likely	Pull cord to inflate the life vest.
Arguable	Wear safety vest when exiting over water.
Suspect	Life jackets are available.
Wrong	The lady's life vest is not inflated right.

Comprehension Category	Typical Segment 7 Responses
Certain	Cut lanyard securing raft to aircraft using raft knife.
Likely	You must disconnect the life raft from the plane so the plane doesn't drag it down.
Arguable	What you should do to cut the rope.
Suspect	Pull on the cord to release the raft.
Wrong	Hold on in case of emergency.



- **Describe exactly what you think segments 3 and 4 mean.**



Comprehension Criterion:
Buckle the life vest straps and
tighten. Inflate the vest by pulling
down on the red tab.

Flotation Device Usage (FDC1) Composite Score

Comprehension Category	Frequency	Percent	Weight	Comprehension Score
Certain	22	8.46	1.00	8.46
Likely	66	25.38	0.75	19.04
Arguable	76	29.23	0.50	14.62
Suspect	55	21.15	0.25	5.29
Wrong	36	13.85	0.00	0.00
None	5	1.92	0.00	0.00
Blank	5	-	-	-
Total	265	100		47%

Usable analytical n (260) does not include "blank" responses.



Comprehension Criterion: Buckle the life vest straps and tighten. Inflate the vest by pulling down on the red tab.

Comprehension Category	Typical Segment 3 Responses
Certain	Buckle the life vest strap and tighten.
Likely	Tighten the waist strap.
Arguable	How to buckle.
Suspect	Make sure its on completely.
Wrong	Attach strap from mother to child and another to the seat.

Comprehension Category	Typical Segment 4 Responses
Certain	Inflate one chamber by pulling the cord.
Likely	Pull down to inflate.
Arguable	Inflate.
Suspect	Pull on straps.
Wrong	Take off seatbelt.



- **Fully describe what you think this pictogram means.**

- **Why would it be important?**



Comprehension Criterion:
No smoking in the lavatory. There is a danger of causing a fire.

No Smoking in Lavatory (L4) Composite Score

Comprehension Category	Frequency	Percent	Weight	Comprehension Score
Certain	58	43.00	1.00	43.00
Likely	23	17.04	0.75	12.78
Arguable	49	36.30	0.50	18.15
Suspect	4	2.96	0.25	0.74
None	1	0.74	0.00	0.00
Total	135	100		75%



Comprehension Criterion:
No smoking in the lavatory. There is a danger of causing a fire.

Comprehension Category	Typical Part 1 Responses
Certain	Do not smoke in the lavatory.
Likely	No smoking.
Suspect	Do not sneak in the bathroom to smoke a cigarette.
Wrong	Don't put cigarettes into sink or toilet.

Comprehension Category	Typical Part 2 Responses
Certain	You could start a fire.
Likely	Start a fire or stop up sink or toilet.
Arguable	Because it is against the law and you could be fined.
Suspect	Smoking can set off the smoke or fire alarm.
Wrong	Smoking can disturb cabin pressure.



- Fully describe what you think these people are doing.

- Why do you think they are doing different things?

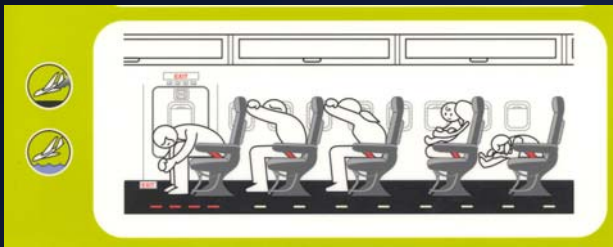


Comprehension Criterion:
The people are assuming the brace position for impact or emergency landing. They are of different sizes and some have a seat to lean against whereas others do not.

Brace Position (BP3) Composite Score

Comprehension Category	Frequency	Percent	Weight	Comprehension Score
Certain	49	39.52	1.0	39.52
Likely	32	25.81	0.75	19.36
Arguable	19	15.32	0.50	7.66
Suspect	10	8.06	0.25	2.02
Wrong	14	19.35	0.00	0.00
Blank	2	-	-	-
Total	126	100		69%

Usable analytical n (124) does not include “blank” responses.



Comprehension Criterion:

The people are assuming the brace position for impact or emergency landing. They are of different sizes and some have a seat to lean against whereas others do not.

Comprehension Category	Typical Part 1 Responses
Certain	They are all showing different bracing positions for either a land ditching or emergency landing.
Likely	They are trying to protect themselves from really injuring themselves.
Arguable	They are ducking for cover.
Suspect	Doing as told.
Wrong	Sleeping.

Comprehension Category	Typical Part 2 Responses
Certain	Depending on where they sit and how old they are. Front can go low where the next two cannot; children should be strapped in seats.
Likely	Various methods of body protection for adults and children.
Arguable	Because they are different ages.
Suspect	The room provided
Wrong	They were not properly informed.



• Who do you think these people are?

• What are they doing?



Comprehension Criterion:
Able-bodied passengers who have already evacuated and are assisting with the evacuation. They are helping other passengers get off the slide during an emergency evacuation.

Emergency Exits (OWEX1) Composite Score

Comprehension Category	Frequency	Percent	Weight	Comprehension Score
Certain	49	39.20	1.00	39.20
Likely	6	4.80	0.75	3.60
Arguable	15	12.00	0.50	6.00
Suspect	51	40.80	0.25	10.20
Wrong	4	6.40	0.00	0.00
Blank	1	-	-	-
Total	126	100		59%

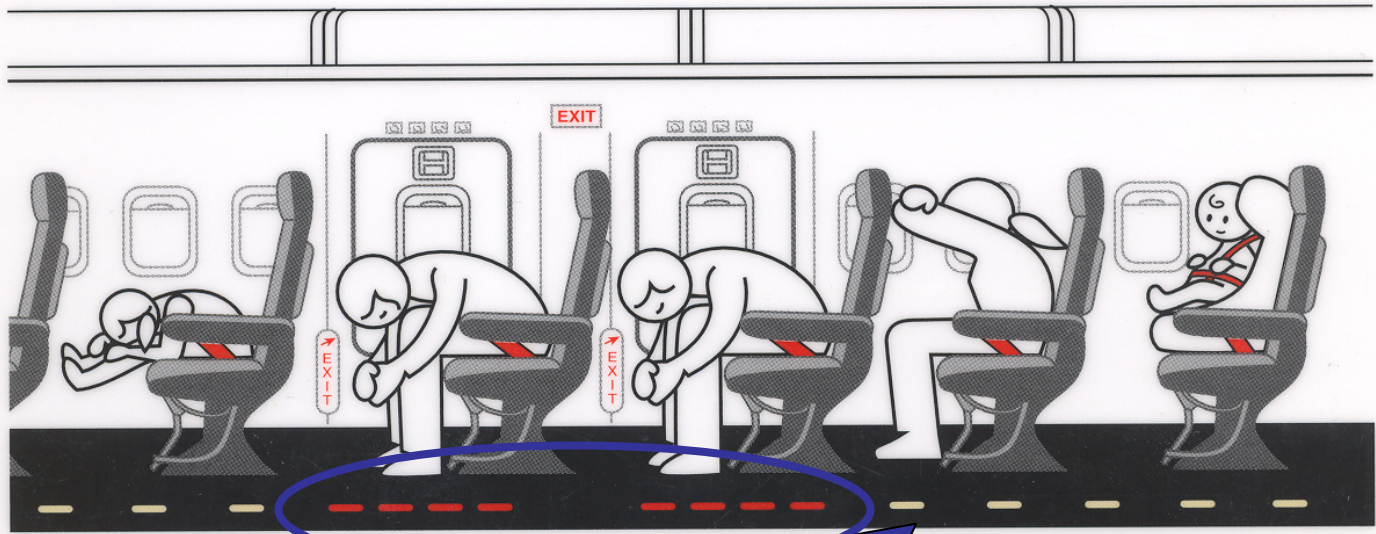
Usable analytical n (125) does not include “blank” responses.



Comprehension Criterion:
Able-bodied passengers who have already evacuated and are assisting with the evacuation. They are helping other passengers get off the slide during an emergency evacuation.

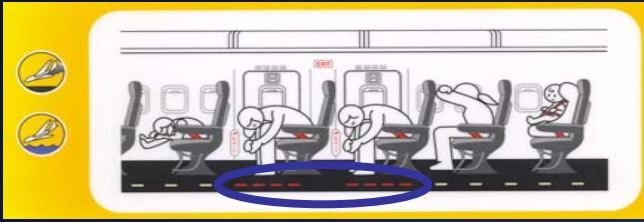
Comprehension Category	Typical Part 1 Responses
Certain	First passengers who left the aircraft
Likely	Evacuees
Arguable	People in a dangerous situation.
Suspect	They crashed and the plane is on fire and they can't take the regular stairs.
Wrong	Flight attendants.

Comprehension Category	Typical Part 2 Responses
Certain	Helping other passengers get off the slide.
Likely	Helping everyone get out safely.
Arguable	Catching the old people.
Suspect	Evacuating.
Wrong	Leaving by slide instead of waiting for the plane to pull to the terminal.



- **What does the red broken line indicate?**

- **What action would you take if you saw this on the plane?**

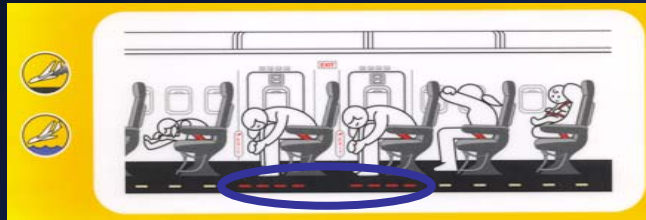


Comprehension Criterion: Passageways leading to overwing emergency exits. Turn into the passageway from the aisle to get to the emergency exit.

Floor Marking of Exit (FL2) Composite Score

Comprehension Category	Frequency	Percent	Weight	Comprehension Score
Certain	128	50.00	1.00	50.00
Likely	35	13.67	0.75	10.25
Arguable	52	20.31	0.50	10.16
Suspect	17	6.64	0.25	1.66
Opposite	2	0.78	-1.00	-0.78
Wrong	19	8.37	0.00	0.00
None	3	2.79	0.00	0.00
Blank	3	-	-	-
Total	260	100		71%

Usable analytical n (256) does not include "blank" responses.



Comprehension Criterion: Passageways leading to overwing emergency exits. Turn into the passageway from the aisle to get to the emergency exit.

Comprehension Category

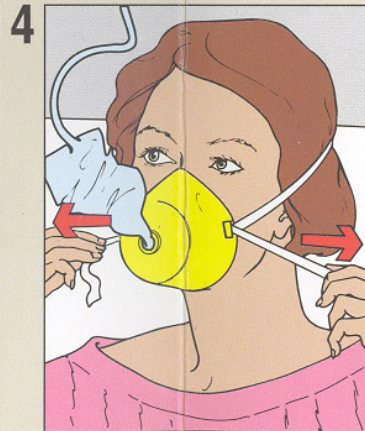
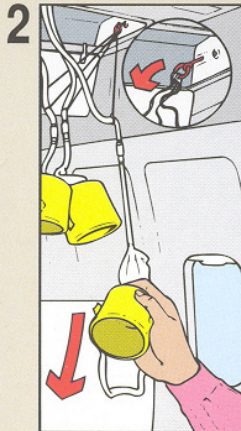
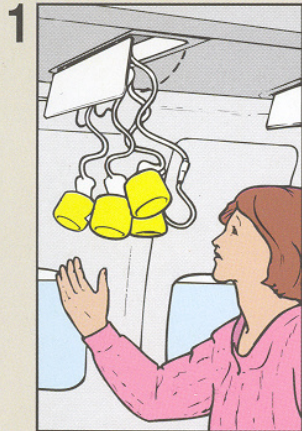
Typical Part 1 Responses

Certain	Red lights to indicate the presence of an exit door on that row.
Likely	There is an emergency exit nearby.
Arguable	Emergency exit lights.
Suspect	Lights.
Opposite	The exit will not open.
Wrong	They are doing something wrong, the lights are lit up.

Comprehension Category

Typical Part 2 Responses

Certain	If there was an evacuation, I would know to turn at the red lights to find an exit.
Likely	Take note of where the emergency doors were.
Arguable	Tell them to move because they are blocking the exits.
Suspect	I would do the same thing these people are doing.
Opposite	Choose a different door through which to exit the plane.
Wrong	Get a flight attendant.



- Fully describe what you think the counter (Sec.) is telling you?

- Why do you think it is important?



Comprehension Criterion:

The maximum number of seconds a passenger should take to don his/her mask and help someone else don theirs. A passenger can become incapacitated very quickly.

Oxygen Equipment Usage (O2) Composite Score

Comprehension Category	Frequency	Percent	Weight	Comprehension Score
Certain	28	15.30	1.00	15.30
Likely	74	40.44	0.75	30.33
Arguable	53	28.96	0.50	14.48
Suspect	27	14.75	0.25	3.69
Wrong	1	1.20	0.00	0.00
Blank	5	-	-	-
Total	189	100		64%

Usable analytical n (183) does not include "blank" responses.

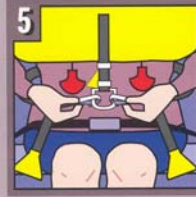


Comprehension Criterion:

The maximum number of seconds a passenger should take to don his/her mask and help someone else don theirs. A passenger can be come incapacitated very quickly.

Comprehension Category	Typical Part 1 Responses
Certain	The counter is telling you that you need to be able to put your mask on this quickly.
Likely	It is a time reference to let you know how fast things should happen.
Arguable	Time it takes to see the masks deploy, know to respond, your action taken, to secure your mask first before helping others.
Suspect	On average, how long it would take to put the mask on.

Comprehension Category	Typical Part 2 Responses
Certain	You only have limited time before experiencing symptoms related to oxygen deprivation.
Likely	Alerts people that they have to act quickly.
Arguable	It is important to don your mask first so that you could be of help to your child.
Suspect	So you can be able to breath with the amount of oxygen.
Opposite	I don't think it is important.
Wrong	Because most people do not know what to do.



- Fully describe what is depicted in segments 8, 9 and 10 of this pictogram.



Comprehension Criterion:

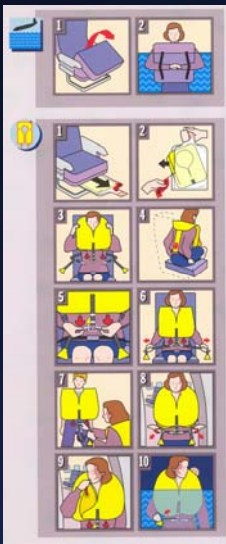
Once outside the airplane, pull down on the red tabs to inflate the life vest. Blow into the red tube for added inflation, if necessary.

Once in the water at night, pull tab to illuminate locator signal light.

Flotation Device Usage (FD2) Composite Score

Comprehension Category	Frequency	Percent	Weight	Comprehension Score
Certain	10	3.92	1.00	3.92
Likely	51	20.00	0.75	15.00
Arguable	129	50.59	0.50	25.30
Suspect	53	20.78	0.25	5.20
Wrong	10	3.92	0.00	0.00
None	2	8.47	0.00	0.00
Blank	4	-	-	-
Total	259	100		49%

Usable analytical n (255) does not include "blank" responses.



Comprehension Criterion:
Once outside the airplane, pull down on the red tabs to inflate the life vest. Blow into the red tube for added inflation, if necessary.
Once in the water at night, pull tab to illuminate locator signal light.

Comprehension Category	Typical Segment 8 Responses
Certain	At the door, pull down tabs to inflate.
Likely	Inflate the life jacket.
Arguable	Pull the strings at the bottom of the vest.
Suspect	Put on vest.
Wrong	Pull strings to tighten.

Comprehension Category	Typical Segment 9 Responses
Certain	If the life preserver fails to inflate with the handles, blow air into the device through the tube.
Likely	You can blow your life vest with a valve.
Arguable	Blow into tube.
Suspect	Inflate.
Wrong	Blow the whistle.



Comprehension Criterion:

Once outside the airplane, pull down on the red tabs to inflate the life vest. Blow into the red tube for added inflation, if necessary.

Once in the water at night, pull tab to illuminate locator signal light.

Comprehension Category

Typical Segment 10 Responses

Certain	Pull tab to activate light when in the water.
Likely	How to activate the emergency light of the vest
Arguable	Pull the tab inside the water.
Suspect	Float in the water using the vest.
Wrong	Pull life jacket to expand.

Pictorial/Pictogram Comprehension Scores

Pictographic Element	Sequence Number	Specific Question a. / b. / c. Scores	Composite Question a. / b. / c. Scores
1. Oxygen Equipment Usage ***	O1	56.0 / - / -	-
2. No Smoking in Lavatory	L3	81.0 / - / -	-
3. Seat Belt Usage	B1	85.1 / - / -	85.2
4. Seat Belt Usage	T1	78.5 / - / -	81.3
5. Overhead Bin Safety *	OB1	73.7 / - / -	73.9
6. Warning *	W1	37.1 / - / -	38.0
7. Emergency Exits ***	FLEX2	57.7 / - / -	60.0
8. Water Evacuation ***	WE3	57.7 / 75.6 / -	66.5
9. Flotation Device Usage ***	FDC1	45.6 / 57.3 / -	47.4
10. No Smoking in Lavatory	L4	96.3 / 61.0 / -	74.7
11. Brace Position *	BP3	76.8 / 60.3 / -	68.6
12. Emergency Exits *	OWEX1	71.8 / 68.4 / -	59.0
13. Floor Marking of Exit ***	FL2	82.8 / 68.5 / -	71.3
14. Oxygen Equipment Usage	O2	65.2 / 59.3 / -	63.8
15. Flotation Device Usage ***	FD2	54.5 / 62.1 / 28.8	49.4
Mean		65.0%	64.5%

Conclusions

- **Results recap findings of previous research.**
- **Mean comprehension ranged from 38% to 85%.**
- **Less than half of pictogram overall comprehension scores exceeded ISO standard success criterion of 67%.**
- **Only 1 pictogram score exceeded the ANSI criterion of 85%.**



Federal Aviation
Administration

*Comprehension of
Safety Briefing Card
Pictorials and Pictograms:
Passenger Attributes*

Cynthia L. Corbett, M.A.

G. A. McLean, Ph.D.

Civil Aerospace Medical Institute
Oklahoma City, OK



Individual Scores

- **Symbol Literacy**
- **Comprehension**
- **Scale**
 - 4 **Certain**
 - 3 **Likely**
 - 2 **Arguable**
 - 1 **Suspect**
 - 0 **Wrong or Don't Know**
 - - 4 **Opposite**
 - **Blanks not included**

Correlation Matrix for Participant Demographics

		Gender	Individual Age	Education Level	Number of Flights	Expertise Level	Symbol Literacy
Gender	<i>r</i>						
	<i>p</i>						
	N						
Individual Age	<i>r</i>	.055					
	<i>p</i>	.122					
	N	785					
Education Level	<i>r</i>	.078*	.734**				
	<i>p</i>	.029	.000				
	N	785	785				
Number of Flights	<i>r</i>	.029	.183**	.189**			
	<i>p</i>	.420	.000	.000			
	N	781	781	781			
Expertise Level	<i>r</i>	.061	.784**	.750**	.335**		
	<i>p</i>	.090	.000	.000	.000		
	N	785	785	785	781		
Symbol Literacy	<i>r</i>	.090*	-.036	.054	.015	.013	
	<i>p</i>	.012	.316	.127	.669	.707	
	N	785	785	785	781	785	

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

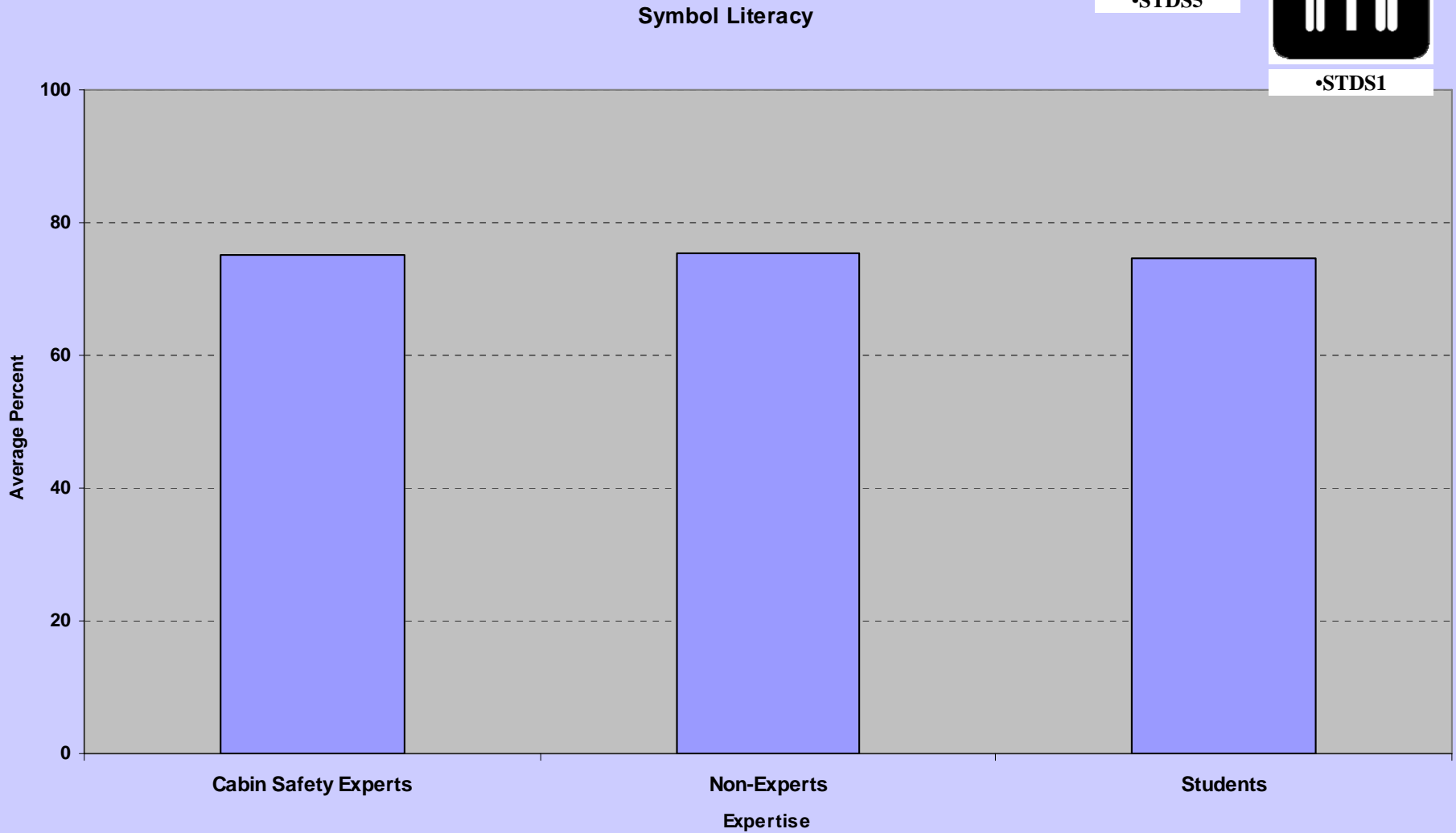
Symbol Literacy



•STDS5



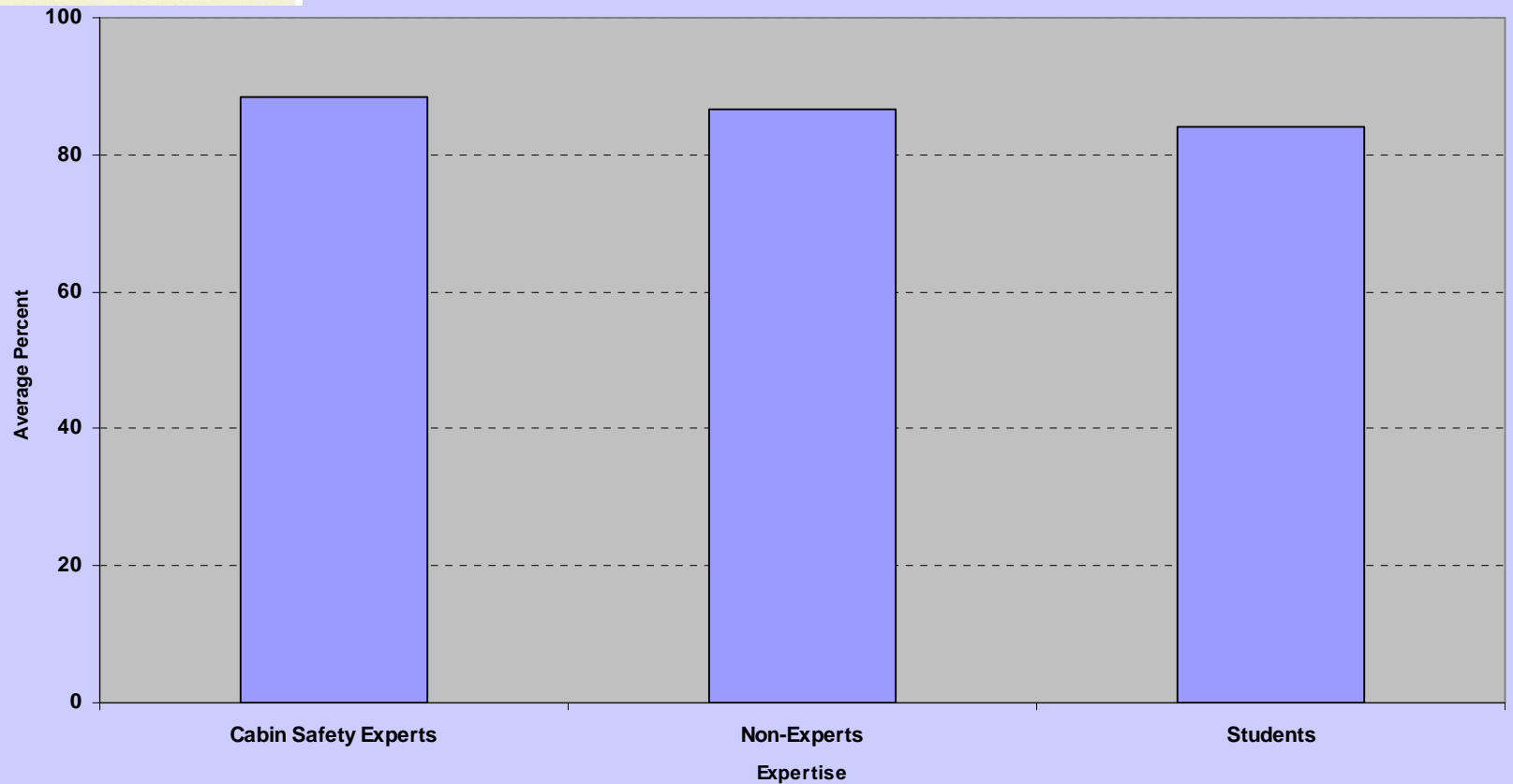
•STDS1



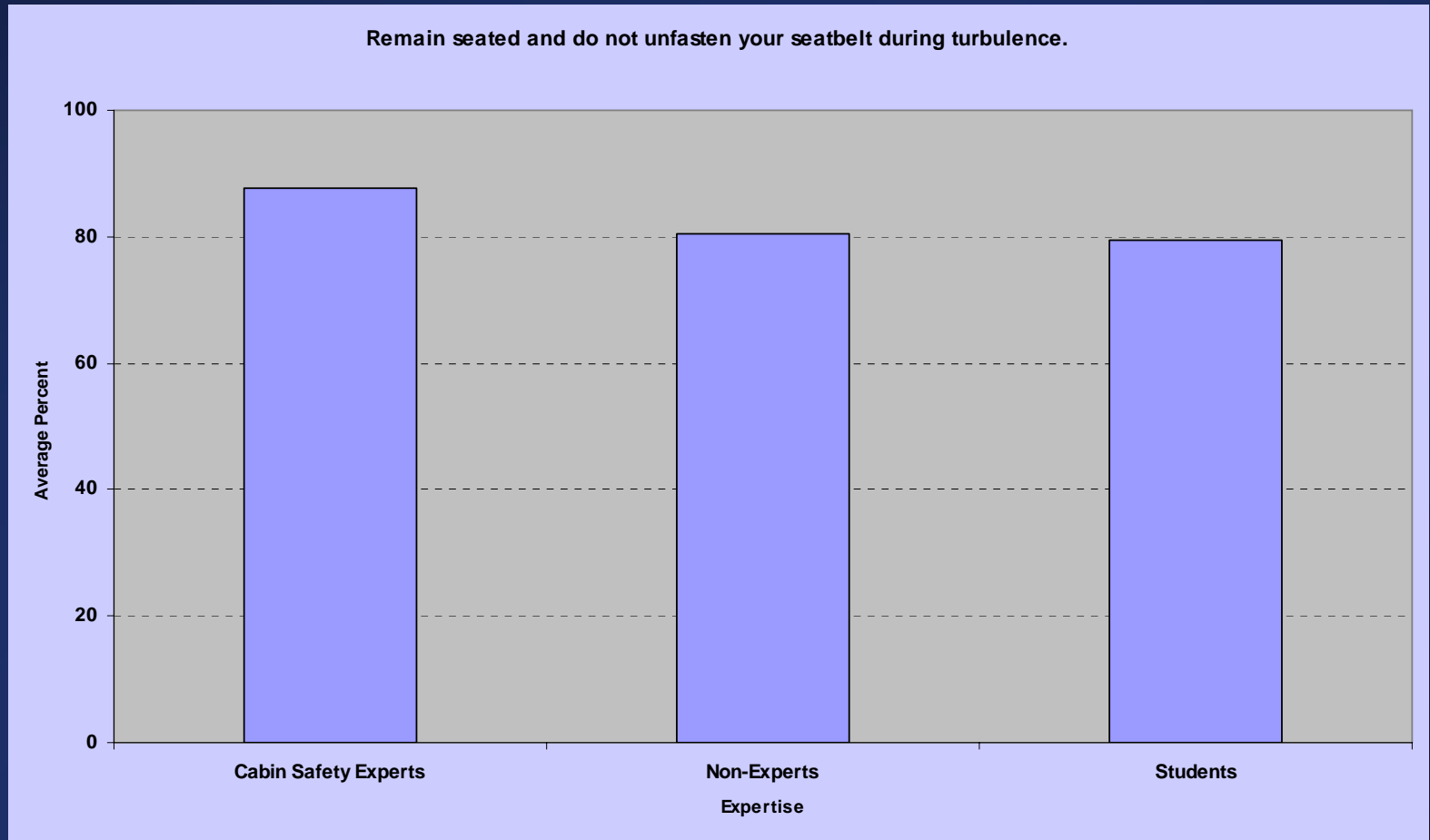
Symbol Literacy



Keep seatbelt fastened at all times during flight.



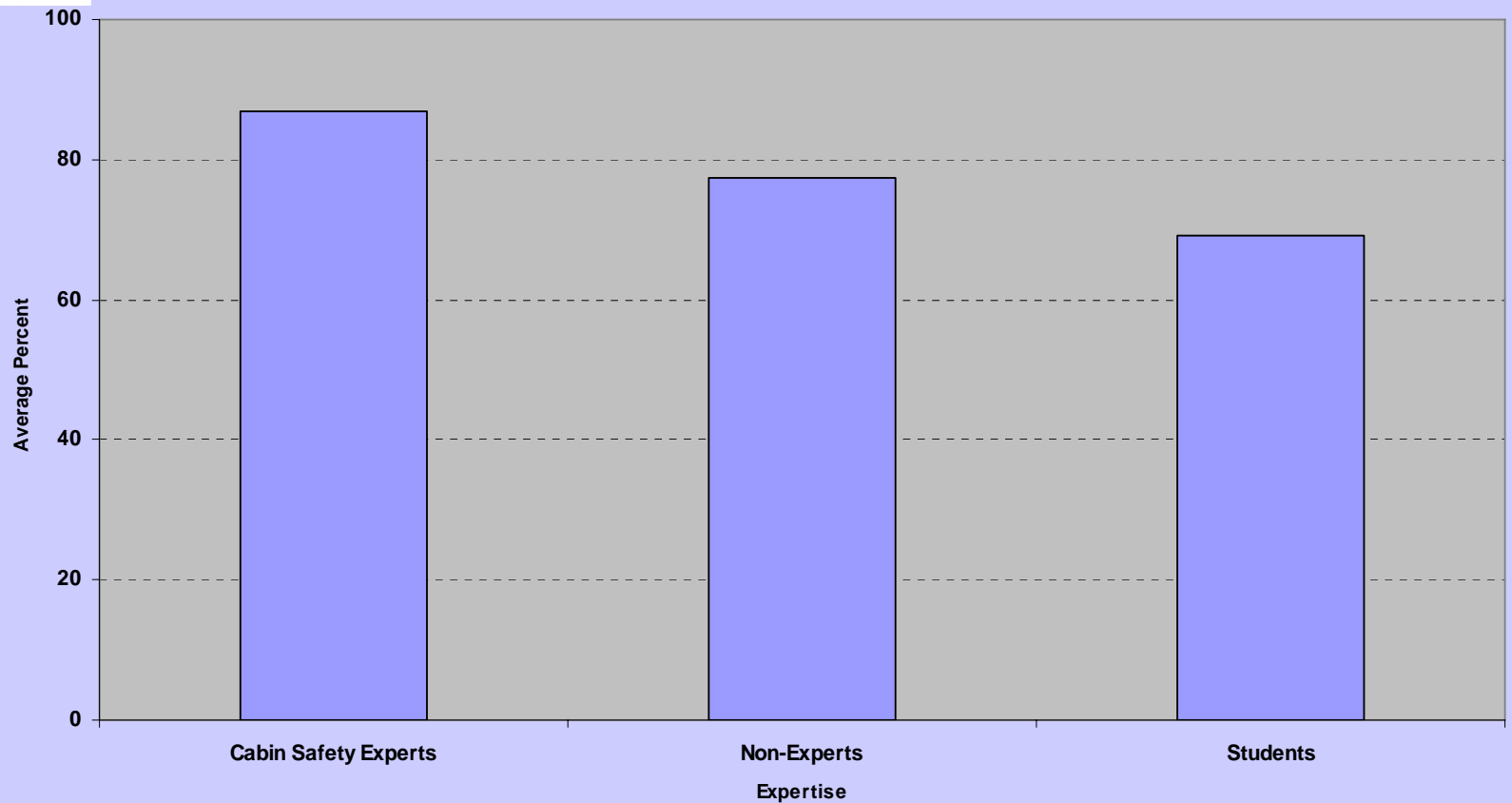
Symbol Literacy Expertise



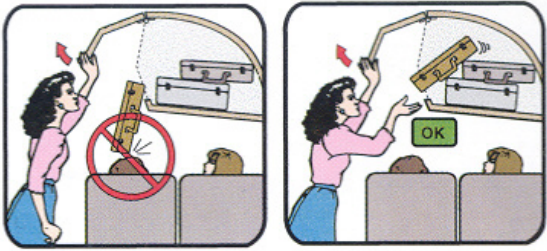
Expertise



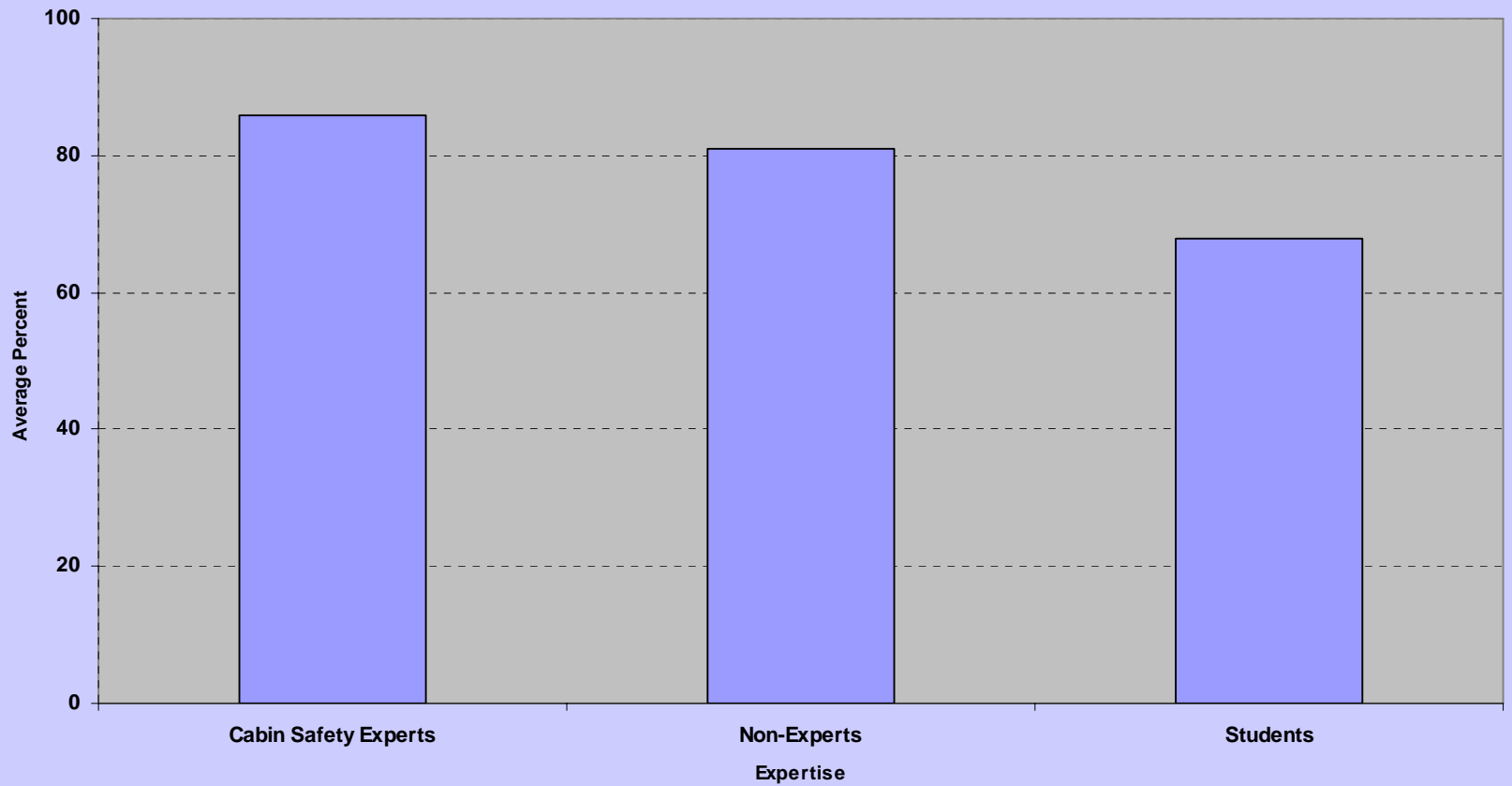
No smoking in the lavatory. There is a danger of causing a fire.



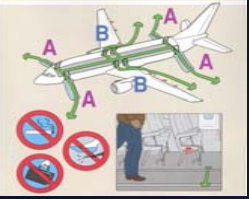
Expertise



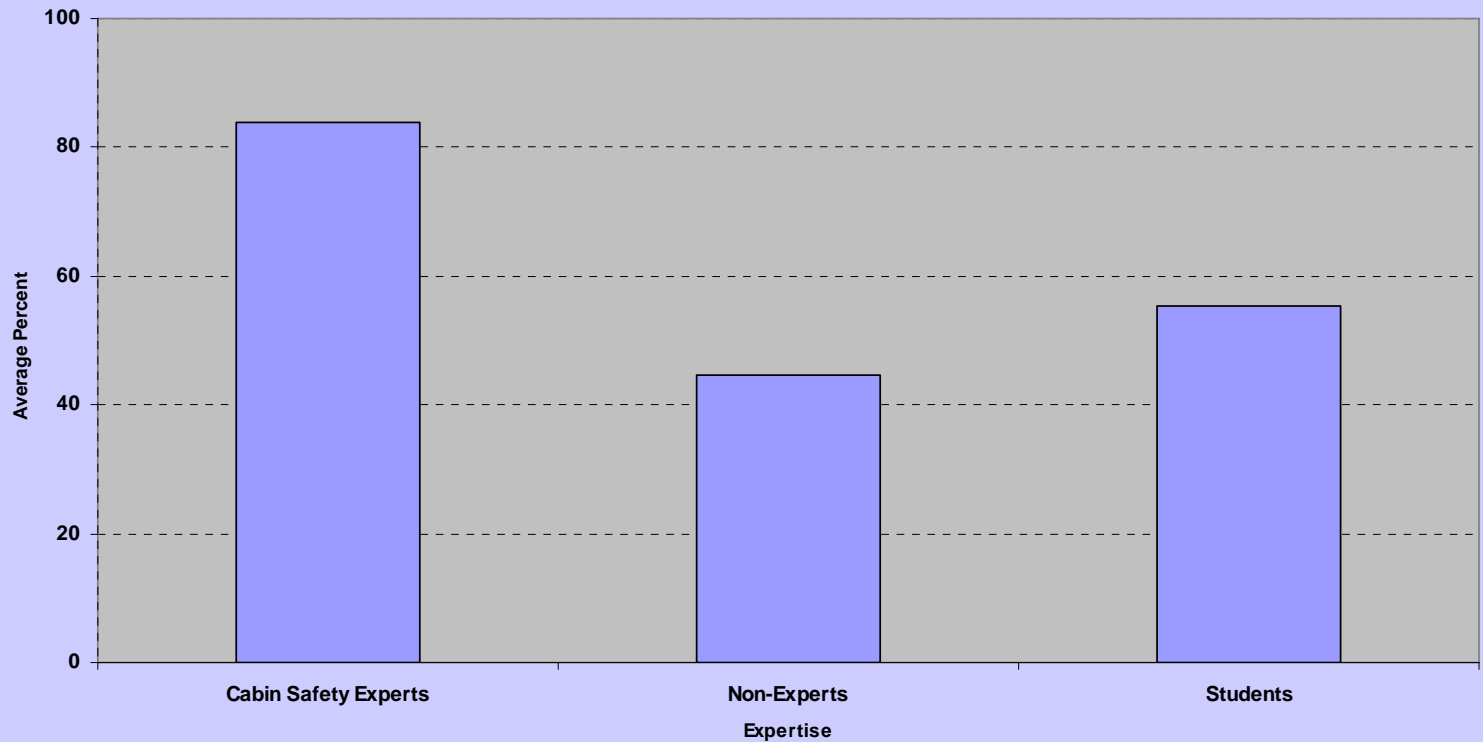
Be prepared to catch falling items when opening the overhead bin.



Expertise



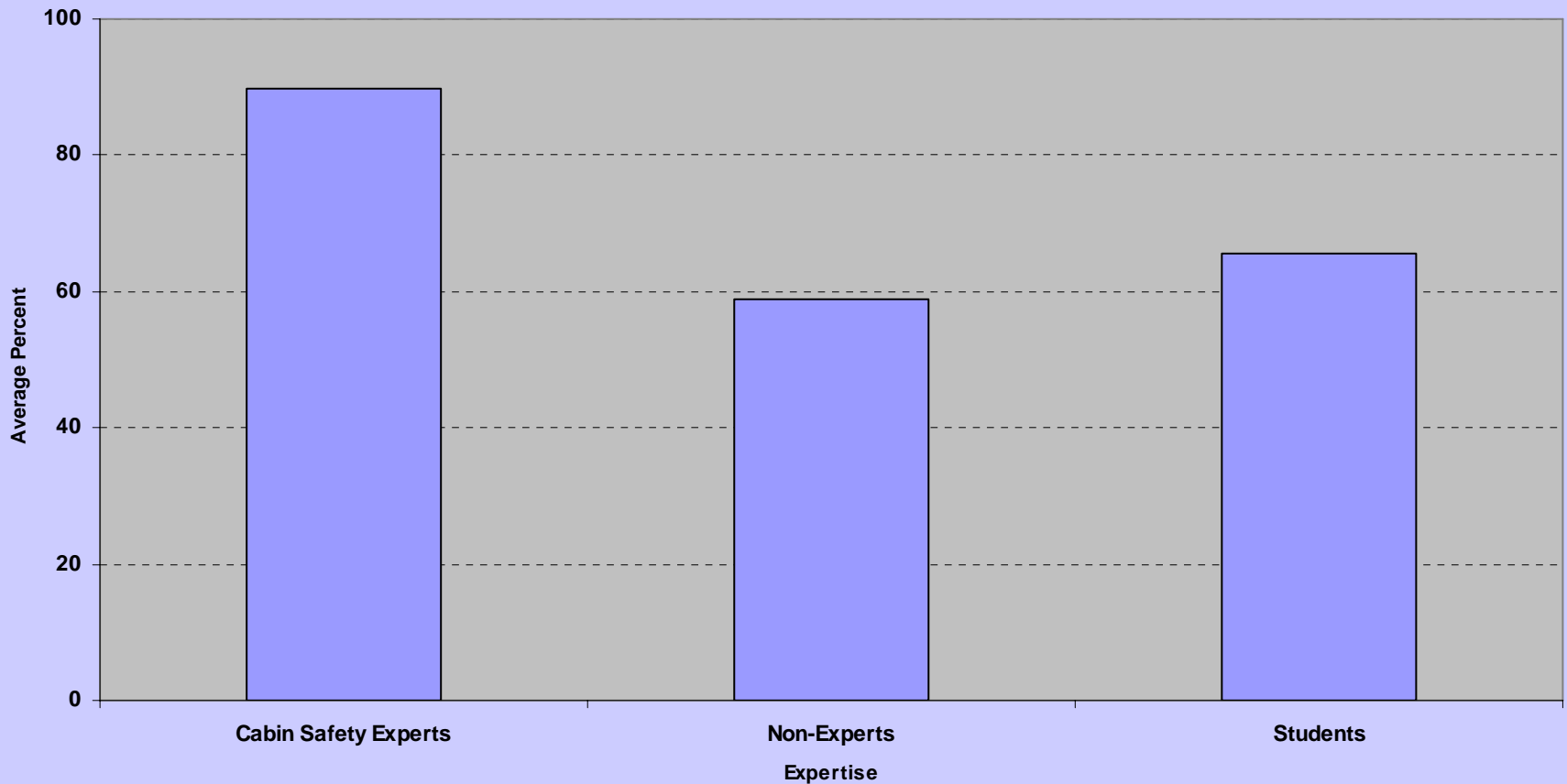
Pictogram A presents operating instructions for a floor-level exit and pictogram B presents operating instructions for an overwing exit.



Expertise Symbol Literacy



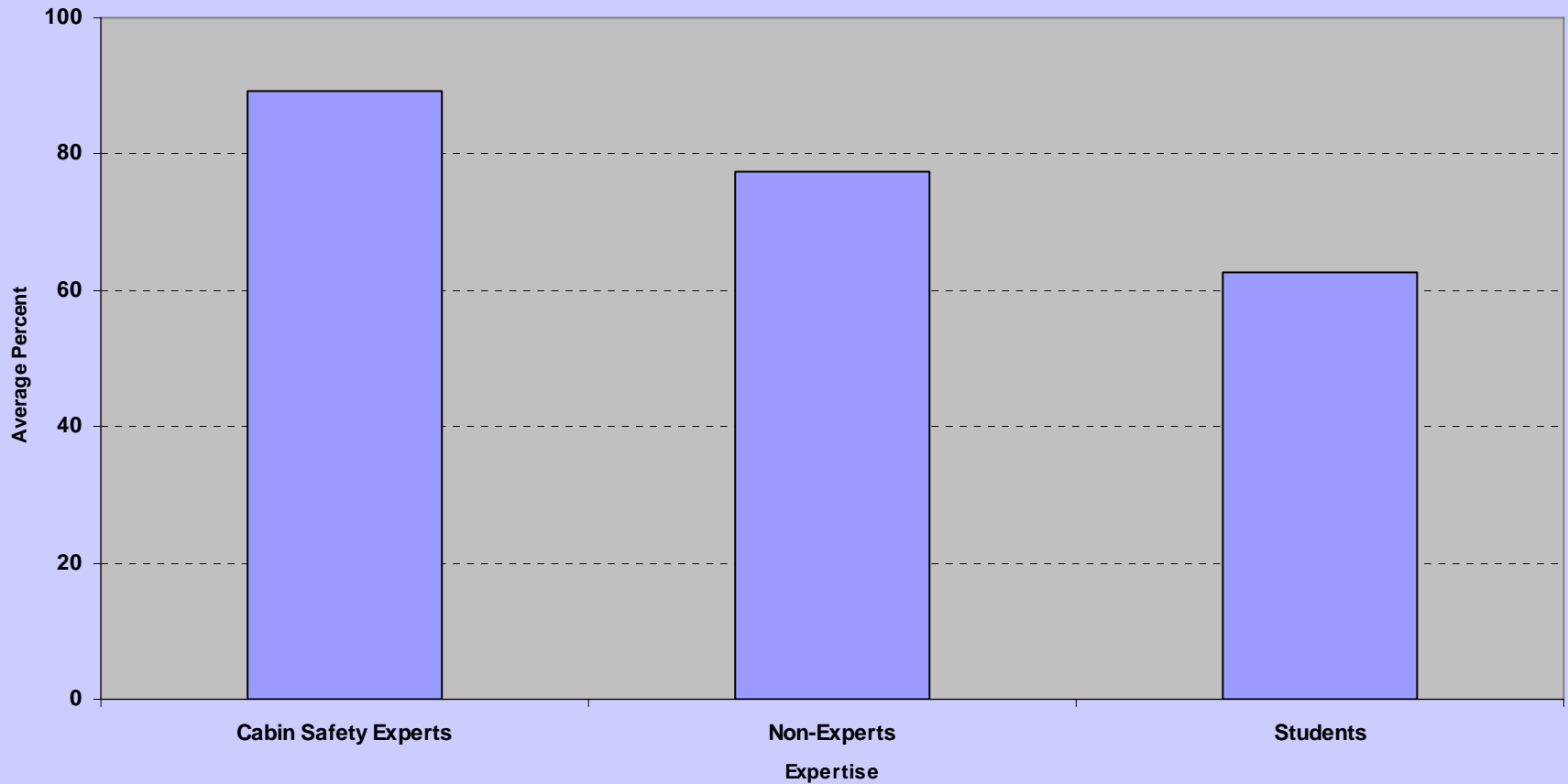
The people are assuming the brace position for impact or emergency landing. They are of different sizes and some have a seat to lean against whereas others do not.



Expertise



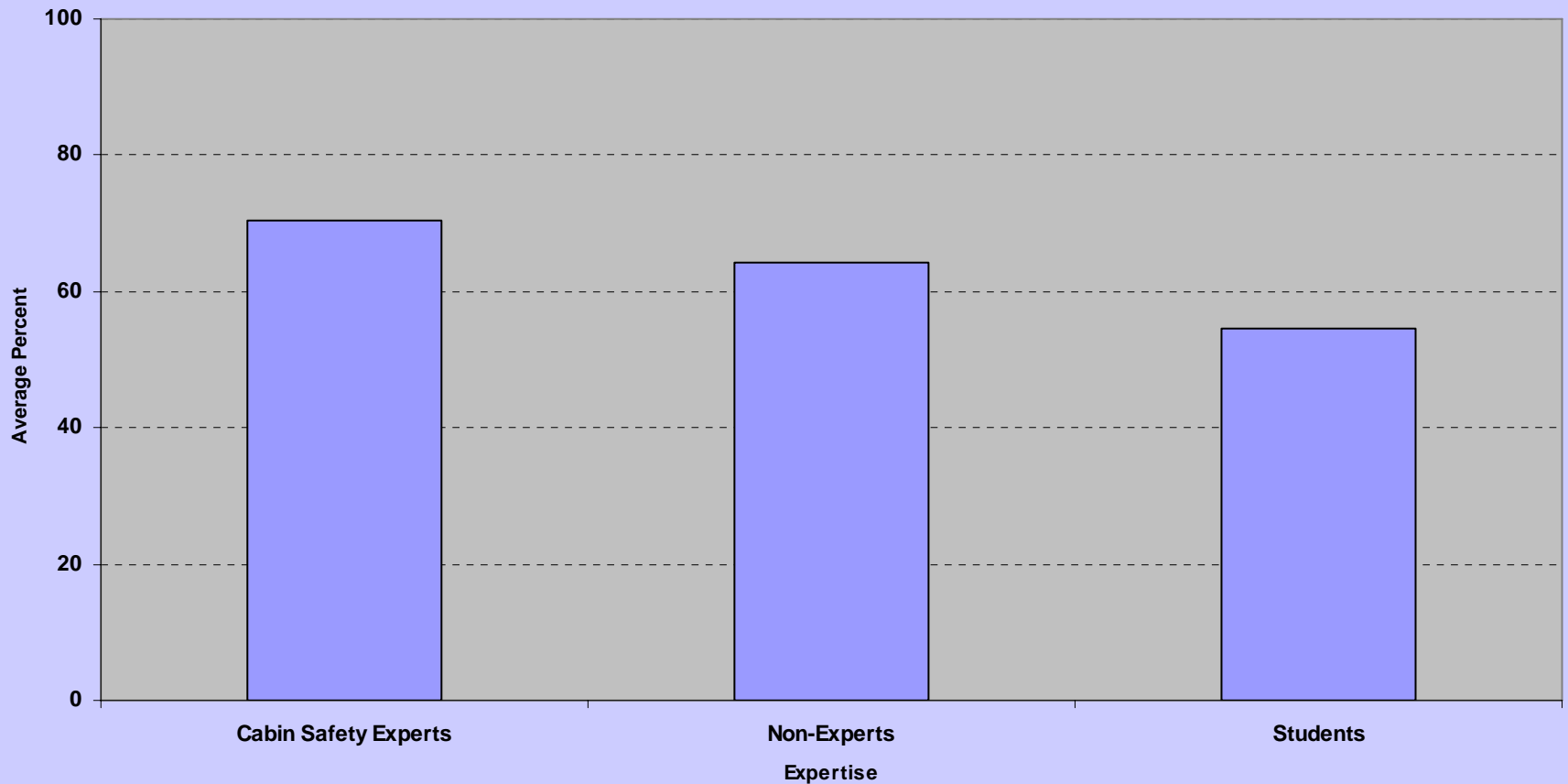
Passageways leading to overwing emergency exits. Turn into the passageway from the aisle to get to the emergency exit.



Expertise



The maximum number of seconds a passenger should take to don his/her mask and help someone else don theirs. A passenger can become incapacitated very quickly.



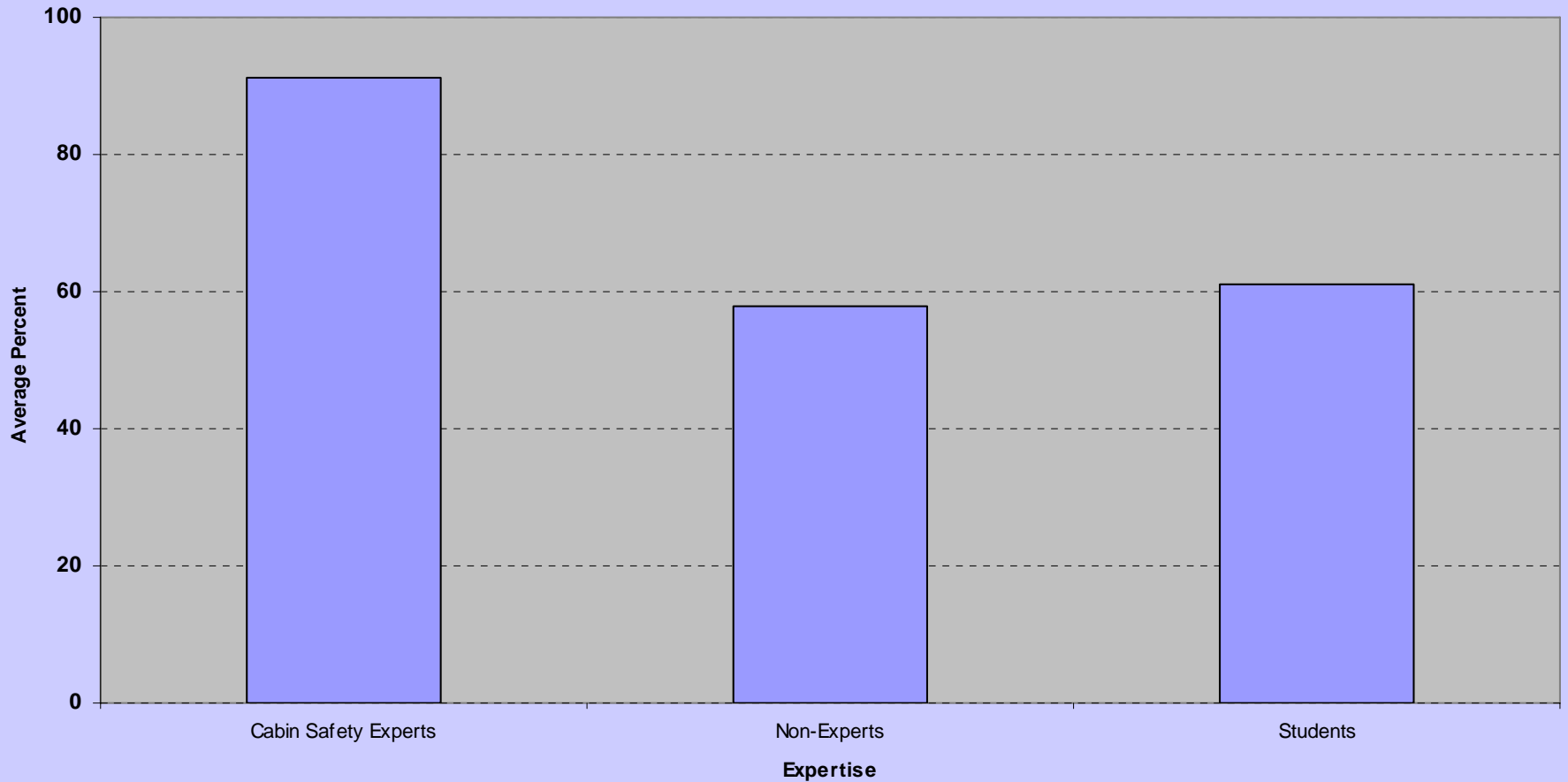


FOR WATER EVACUATION



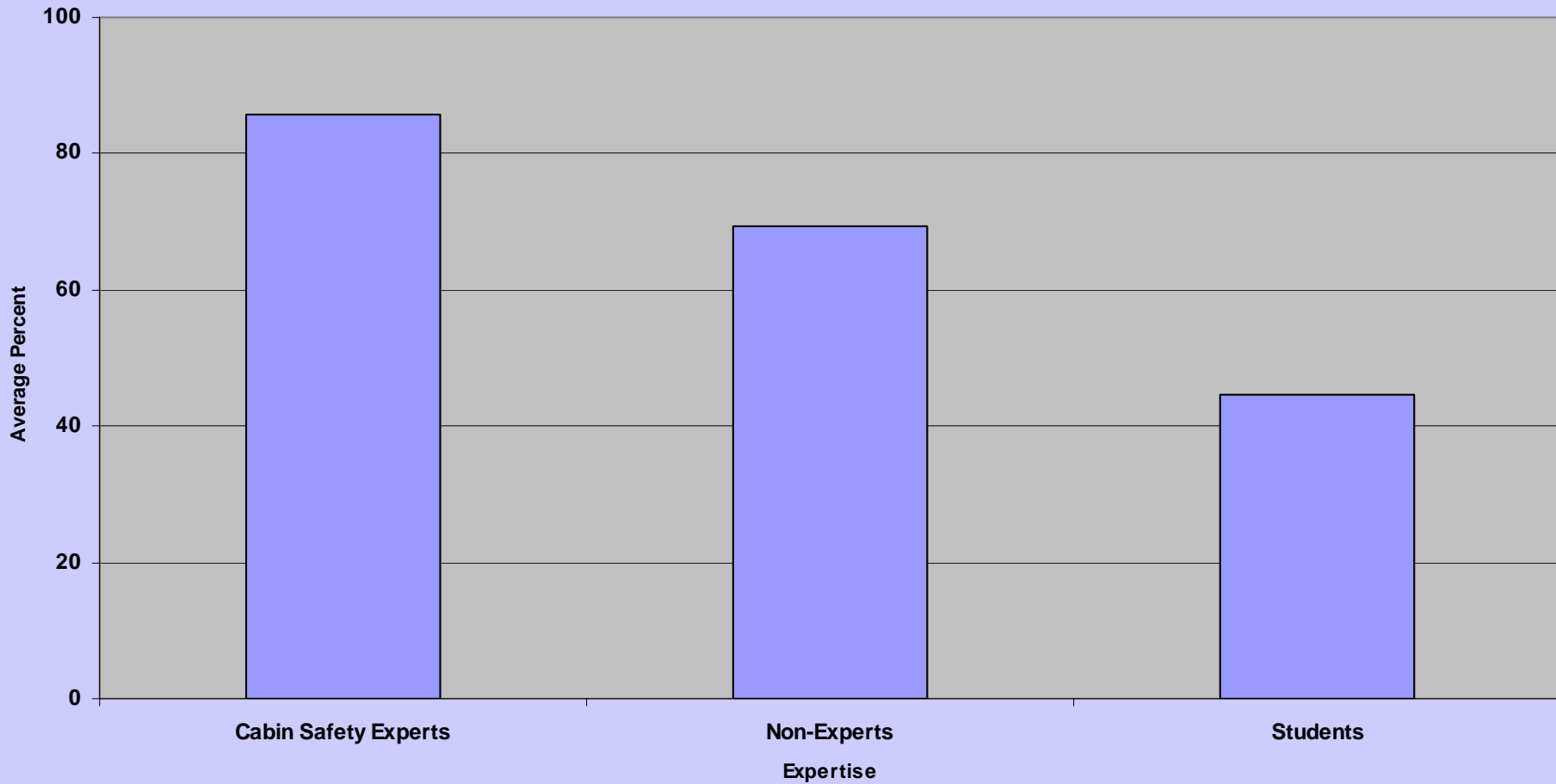
++ Expertise Symbol Literacy

Inflate your life vest at or outside the exit as you prepare to board the life raft. Use the knife in the survival kit to cut the line tethering the life raft to the airplane.





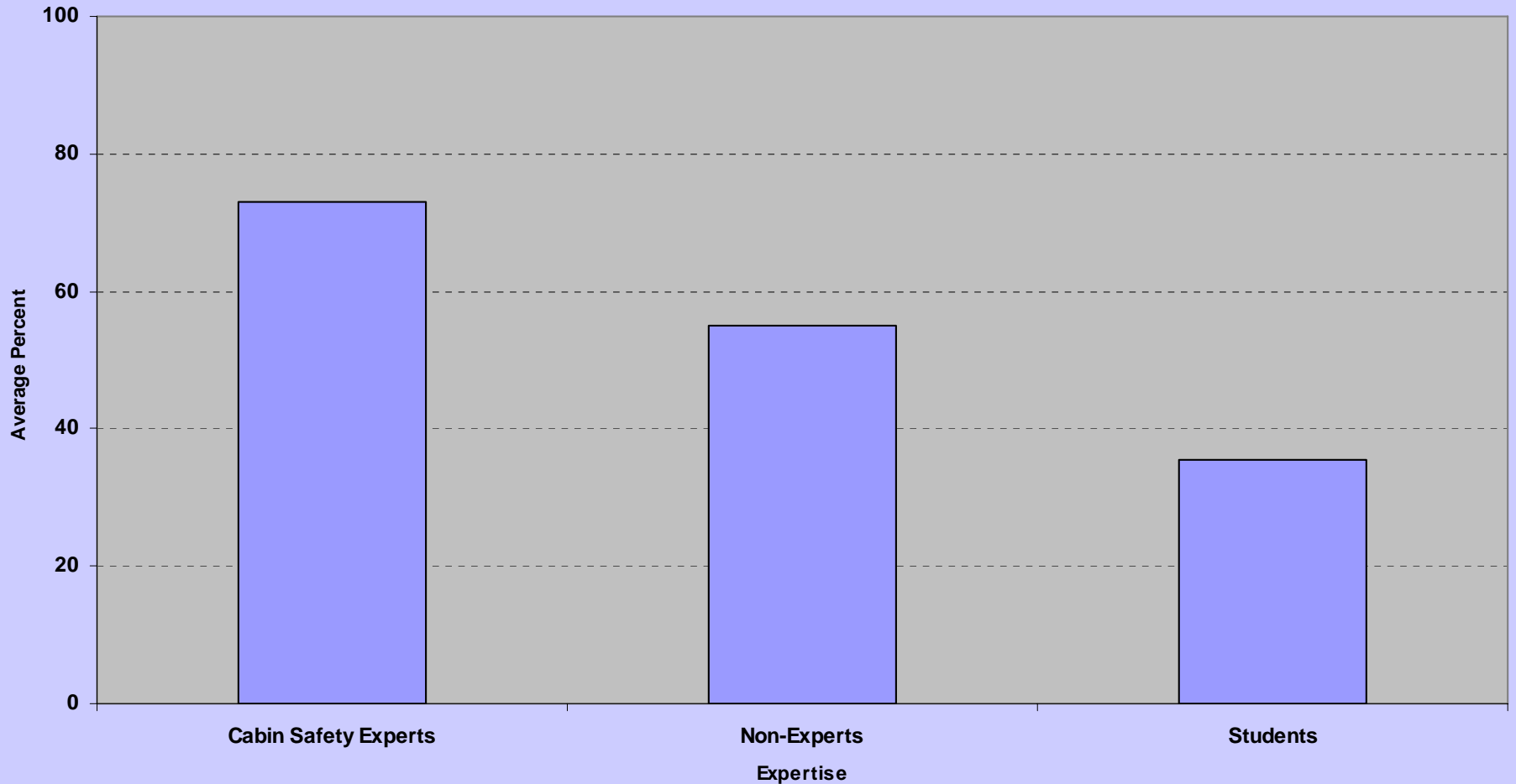
Able-bodied passengers who have already evacuated and are assisting with the evacuation. They are helping other passengers get off the slide during an emergency evacuation.



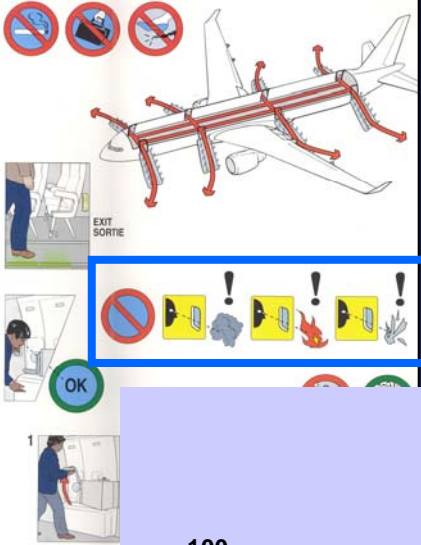


++ Expertise Symbol Literacy

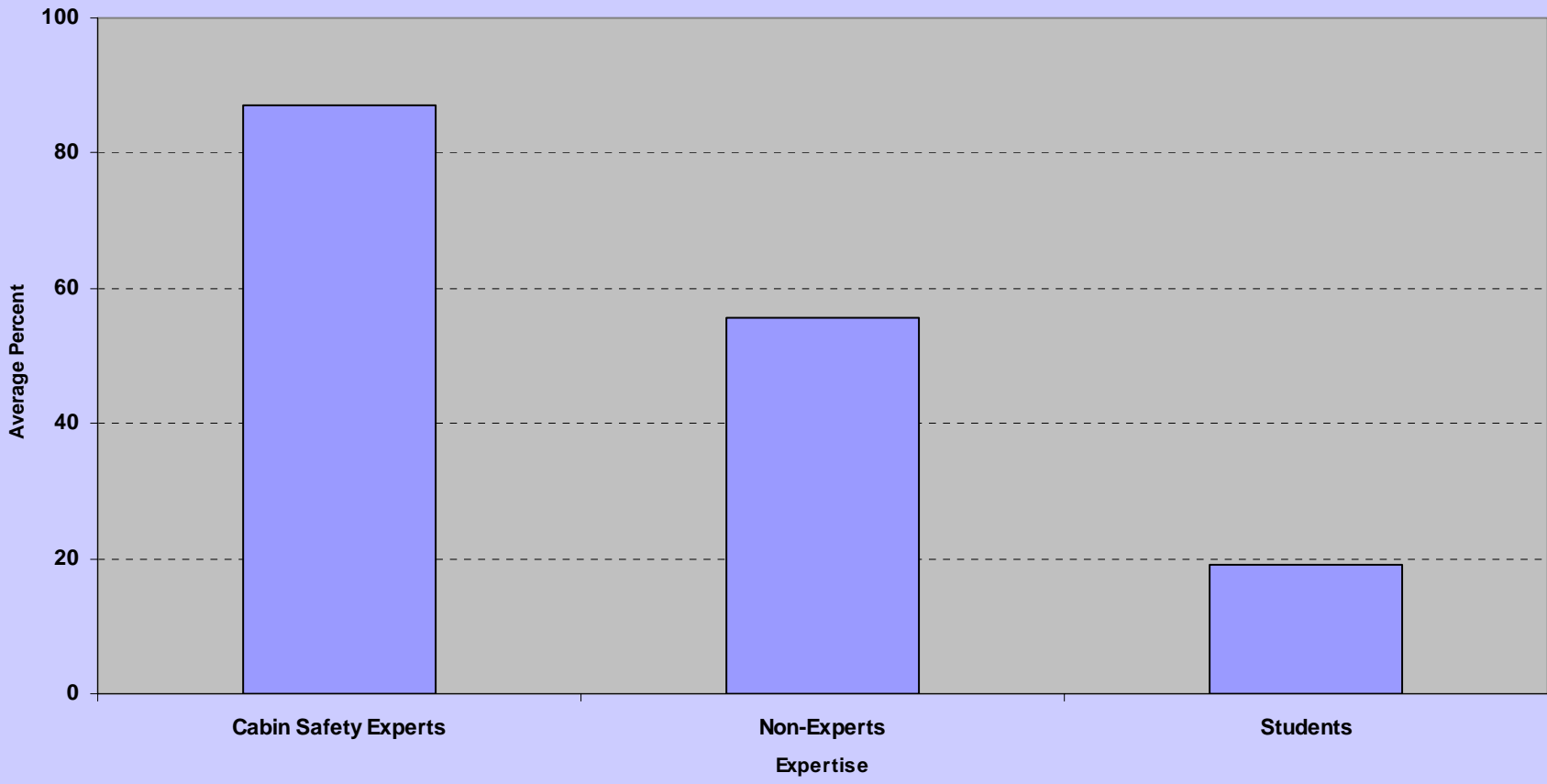
Buckle the life vest straps and tighten. Inflate the vest by pulling down on the red tab.



++ Expertise

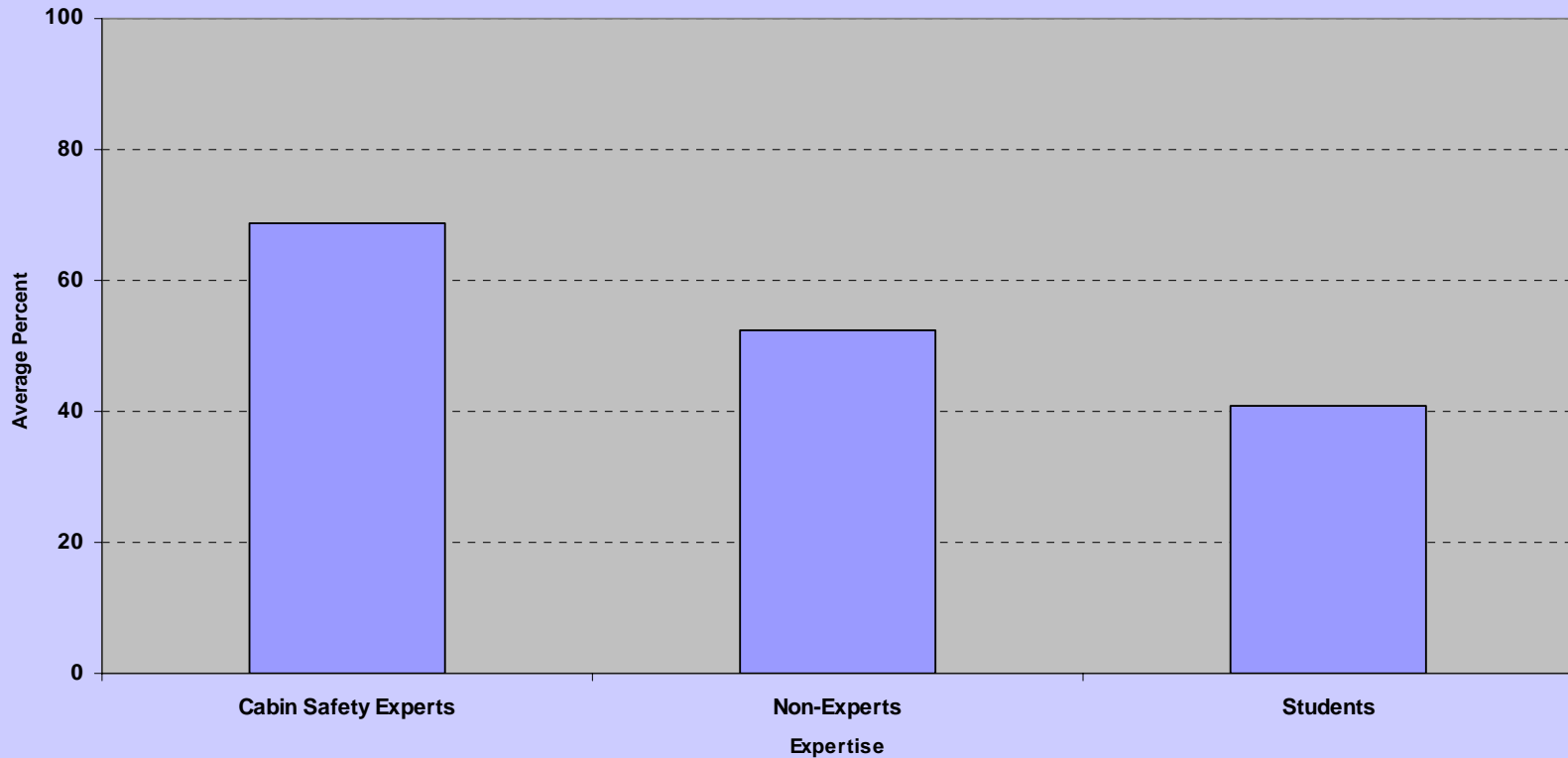


Warning! Look out the window and do not open the door or exit if you see smoke, fire, or dangerous debris .



++ Expertise Symbol Literacy

Once outside the airplane, pull down on the red tabs to inflate the life vest.
Blow into the red tube for added inflation, if necessary. Once in the water at night,
pull tab to illuminate locator signal light.



Conclusions

- **Comprehension and understanding**
 - Exposure and experience
 - Simplicity of illustration
- **What the Heck!!**