

See back cover for an English
translation of this cover

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91584MR



Mana Tohu Mātauranga o Aotearoa
New Zealand Qualifications Authority

Te Pāngarau me te Tauanga, Kaupae 3, 2023

91584M Te arotake pūrongo ā-tauanga

Ngā whiwhinga: E whā

TE PUKAPUKA RAUEMI

Tirohia tēnei pukapuka hei whakaoti i ngā tūmahi mō Te Pāngarau me te Tauanga 91584M.

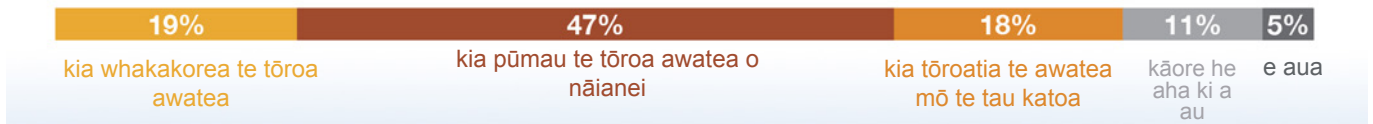
Tirohia kia kitea ai e tika ana te raupapatanga o ngā whārangi 2–7 kei roto i tēnei pukapuka, ka mutu, kāore tētahi o aua whārangi i te takoto kau.

E ĀHEI ANA TŌ PUPURI I TĒNEI PUKAPUKA HEI TE MUTUNGA O TE WHAKAMĀTAUTAU

TE RAUEMI TUATAHI: TE TŌROA AWATEA

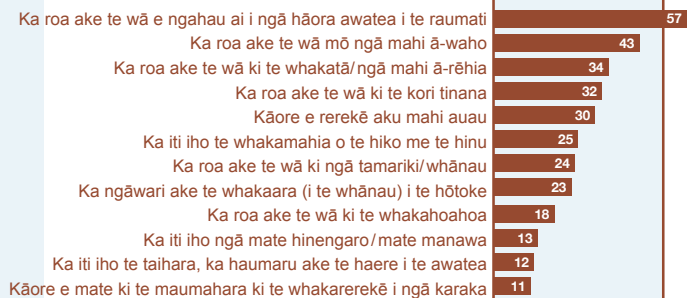


I te tau 2008, e 90% o ngā tāngata o Aotearoa i hiahia ki te tōroa awatea i Aotearoa. Nā ngā matapakinga, huri noa i te ao, e pā ana ki te whakaroa i te tōroa awatea ki te tau katoa, ka rangahaua e mātou te tautoko a te marea kia pūmau rānei te pūnaha tōroa awatea (e 47%), kia whakakorea rānei te tōroa awatea (19%), kia pūmau rānei te nekehia whakamuatia o ngā karaka (18%) - me ngā take e hinga pērā ana rātou.



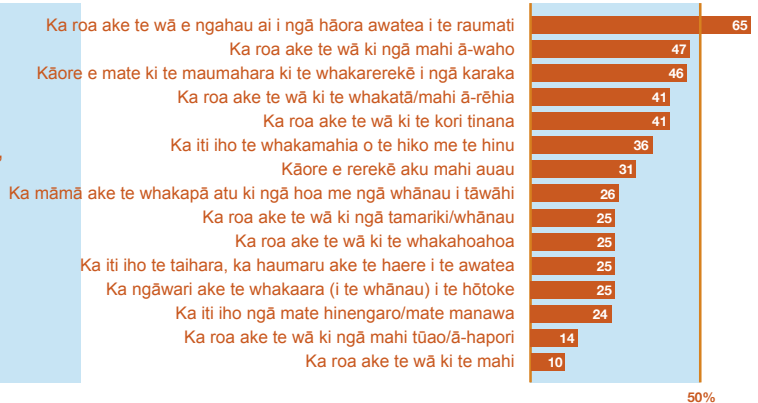
Te Ata 1(a): Kia pūmau te tōroa awatea o nāianei

Ko ngā take matua i puta i te hunga i hiahia rā kia pūmau te tōroa awatea o nāianei, e hāngai ana ki te mahi. I nui noa atu i te haurua te hunga i kī rā *ka roa ake te wā e ngahau ai i ngā hōra awatea i te raumati* (e 57%), ā, i neke atu i te rua-haurima i pai ki te *roa ake o te wā e rere ai ngā mahi ā-waho i te kāinga* (e 43%), ā, i pai ki te hautoru te *roa ake o ngā hōra whakatā/mahi ā-rēhia* (e 32%) me te



Te Ata 1(b): Kia tōroatia te awatea mō te roanga o te tau

E rua hautoru (e 65%) o ngā kaiwhakautu pātai i hiahia rā kia pūmau te nekehia whakamuatia o ngā karaka, ka kī, *ka roa ake te wā e ngahau ai i ngā hōra awatea i te raumati/i te wā e mahana ake ana te huarere*, ā, i kī rā te haurua, *ka roa ake te wā ki ngā mahi ā-waho* (e 47%), ka mutu, *kāore e mate ki te maumahara ki te whakarerekē i ngā karaka* (e 46%).



Te tukanga

I ahu mai ēnei hua i ā mātou rangahau i ngā kaiwhakautu pātai motuhake 1010, mai i te 26 ki te 29 o Māehe, 2021, 18 tau te pakeke, e pakeke ake ana rānei, i ahu mai i a Dynata, ā, i whakahaeretia mā te ipurangi. Ko te ±3.1% te mōrahi o te pae hapa (i te taumata whakapono e 95%). Kua inea ngā tīpakonga e ai ki te ia me te pakeke, e whakakanohitia katoatia ai te taupori, 18 tau te pakeke, e pakeke ake ana rānei. Kāore ngā rangahau i whakahaeretia mā tētahi whakahaere, engari hei wāhanga mō ngā mahi rangahau ā-pāpori a Rangahau Aotearoa, e rangahau nei i ngā whakaaro o ngā tangata o Aotearoa ki ngā take o te wā.

Ngā mātāpuna: <https://www.researchnz.com/assets/resources/DaylightSaving.pdf>

<https://www.govt.nz/browse/recreation-and-the-environment/daylight-saving/public-attitudes-to-daylight-saving/>

RESOURCE ONE: DAYLIGHT SAVING



In 2008, 90% of New Zealanders were in favour of daylight saving in New Zealand. With recent international discussion about extending it all year round, we polled public support for keeping the current daylight saving system (47%), ending daylight saving (19%), or for permanently moving the clocks forward (18%) – and the reasons why.

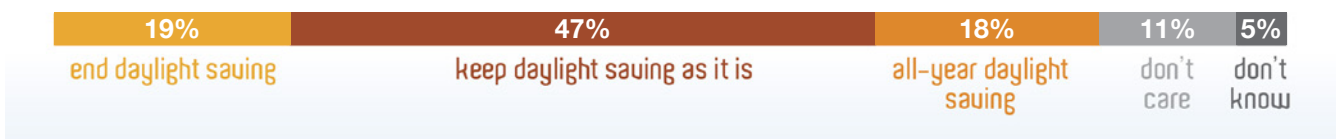


Figure 1(a): Keep daylight saving as it is

The main reasons given by those in favour of **keeping** the current daylight saving system were activity related. Well over half stated it gives *more time to enjoy daylight hours during summer* (57%), over two-fifths like *more time for outdoor activities at home* (43%), while a third enjoy *more relaxation / leisure hours* (34%), and *more time for physical activity* (32%).

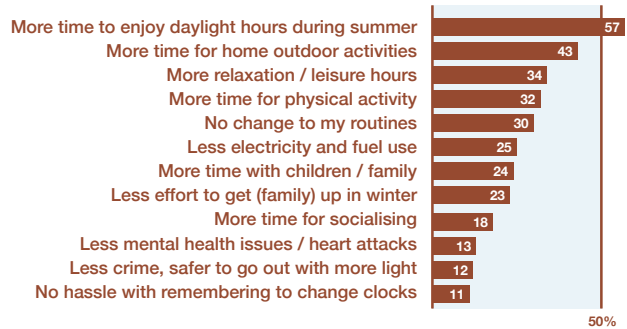
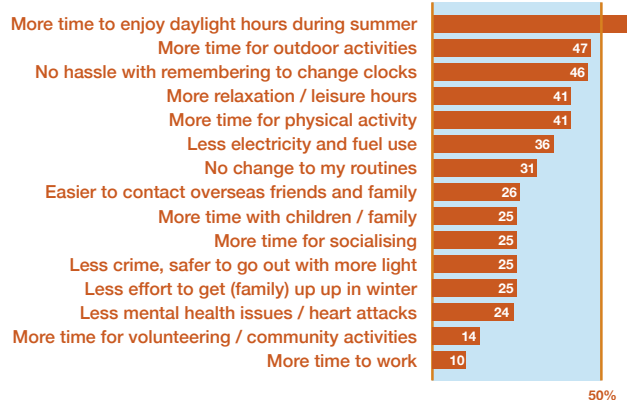


Figure 1(b): All-year daylight saving

Two-thirds (65%) of respondents in favour of moving our clocks forward permanently reported it would give *more time to enjoy daylight hours during summer / warmer weather*, and half reported there would be *more time for outdoor activities* (47%), but also *no hassle with remembering to change clocks* (46%).



Methodology

These results are based on our surveys of 1 010 independent respondents between 26 and 29 March, 2021, aged 18 years and over, each sourced from Dynata, and conducted online. The maximum margin of error is ±3.1% (at the 95% confidence level). The samples have been weighted by gender and age to ensure the results are representative of the population 18 years and over. The surveys were not undertaken on behalf of any organisation, but as part of Research New Zealand’s social polling of New Zealanders’ opinions about current issues.

Sources: <https://www.researchnz.com/assets/resources/DaylightSaving.pdf>
<https://www.govt.nz/browse/recreation-and-the-environment/daylight-saving/public-attitudes-to-daylight-saving/>

TE RAUEMI TUARUA: KIA KOTAHI TĀORA TE ITINGA IHO: TE TORO A TE KAIMĀTAI HINENGARO I TE WHAKAHOAHOA HEI WHAKAITI PARA

Kua kite rā ngā kairangahau mātai hinengaro i te Whare Wānanga o Luxembourg, ka taea te āta whakawhere ngā manuhiri hōtēra kia iti iho te nui o ngā tāora ka whakamahia e rātou i ia rā. Ki te iti iho ngā tāora hei horoi, ka iti iho te moumou o te wai, o te pūngao, me te hopiwē. He rongopai tēnei mō te taiao, ka mutu, ka whakahekea ngā utu, ā, mā konei e iti iho ai ngā utu i ngā hōtēra.

Nā ngā rangahau o mua i Amerika, ka whakapae ngā kairangahau o tēnei rangahau ka iti katoa te whakamahia o ngā tāora e ngā manuhiri ka riro i a rātou te karere kei roto rā te kīanga nei, “e 75% o ngā manuhiri i tēnei rūma”.

I āwhinatia tēnei whakamātautau e ngā hōtēra e rua i ngā whakataunga retihuka i Huiturangi me Ateria i te upoko o te tau 2013. Ko te hunga i whai wāhi ki te rangahau, ko ngā manuhiri hōtēra 132 i hararei rā ki tētahi o ngā hōtēra e rua. Kāore ngā manuhiri i mōhio ki tā rātou whai wāhi ki te rangahau, ā, i tukuna matapōkeretia rātou ki tētahi o ngā āhuatanga e toru. I ia āhuatanga tētahi karere e akiaki ana i ngā manuhiri ki te whai wāhi atu ki te hōtaka tukurua tāora, i tāngia rā ki ngā tohu i waiho ai kia āta kitea

Te mātāpuna (kua whakahāngaitia): www.tourismaker.com/austria/

i ngā kaumanga manuhiri. Katoa ngā tohu i āta whakamahara i ngā manuhiri ki ngā pānga taiao o te whakamahi tāora. Heoi, i āpitihia ki tētahi tohu te kōrero: “e 75% o ngā manuhiri i tēnei hōtēra ka tukurua i ō rātou tāora”, me tētahi atu tohu e whakatakoto ana i te kōrero: “e 75% o ngā manuhiri i tēnei rūma ka tukurua i ō rātou tāora.” Kei te reo Tiamana me te reo Pākehā ngā tohu, nō reira, kua mārāma te nuinga o ngā manuhiri i ēnei whakataunga tairanga (*alpine resort*).

I whakaemitia e ngā kaimahi o ngā rūma hōtēra ngā raraunga whakamahi tāora nō rātou e whakapaipai ana i ngā rūma o ngā manuhiri. Kāore ngā kaimahi nei i mōhio ki ngā whakapae a ngā kairangahau.

“I kitea rā e mātou, ka tino iti iho te whakamahia o ngā tāora e ngā manuhiri mēnā ka whākina ki a rātou ngā whanonga o ngā manuhiri o mua, i ō rātou rūma,” te kī a te kairangahau matua, a Tākuta Gerhard Reese. I te horopakī o te “rūma”, kotahi tāora ki ia tangata, i ia rā te toharite o te whakamahinga. Nō te whakatairitenga ki te hunga i kīia ki ngā whanonga i te hōtēra katoa, 1.6 tāora ki ia tangata, i ia rā te toharite. Me te aha, ka 40% te penapenahia o ngā tāora me horoi.

E hāngai ana ēnei hua ki ētahi rangahau ruarua e āhua ōrite ana i whakahaerehia i Amerika. E tohua ana i tēnei rangahau, tērā pea, arā anō ētahi huarahi hei whakawhere i te tangata ki te mahi tika mā te āta āki.

Te Ata 2: Ngā karere kaumanga mō tēnā, mō tēnā o ngā āhuatanga whakamātau e toru

Te Āhuatanga 1

Te Āhuatanga 2

Te Āhuatanga 3

RESOURCE TWO: A TOWEL LESS: HOW PSYCHOLOGISTS HARNESS SOCIABILITY TO CUT WASTE

Hotel guests can be gently persuaded to reduce the number of towels they use each day, psychology researchers at the University of Luxembourg have found. With fewer towels to wash, this reduces the waste of water, energy, and detergent. This is good news for the environment and it cuts costs, helping hotels to reduce prices.

From previous research in the US, the researchers of this study hypothesised that they would find guests receiving the message including the phrase “75% of guests in this room” would use the least towels.

Two hotels in Swiss and Austrian ski resorts helped with this experiment in early 2013. The participants of the study were 132 hotel guests who spent their holiday in one of two hotels. Guests were not aware that they were participants in the study, and were randomly assigned to one of three conditions. In each of the conditions, a message urged guests’ participation in the towel re-use programme, printed on signs that were placed obviously in the guests’ bathrooms. All signs gently reminded guests of the environmental impact of towel use. However, one of the signs added that: “75% of guests in this hotel reuse their towels” with another sign talking of: “75% of guests in this room reuse their towels”. The signs were in both German and English, so would have been understood by most guests in these alpine resorts.

The hotel room staff collected towel use data while they were servicing the guests rooms. These staff were blinded to the researchers’ hypothesis.

“We found that guests cut their towel use significantly when told of the behavior of previous guests in their room,” said the lead researcher Dr Gerhard Reese. In the “room” scenario, guests used, on average, one towel per person per day. This compared with 1.6 towels per person per day for those told of behaviour in the hotel as a whole. This amounted to a 40% saving in the number of towels needing to be washed.

These results are consistent with a handful of similar studies conducted in the US. This research points to the possibility of finding other ways to persuade people to do the right thing using such subtle pressure.

Figure 2: Bathroom messages for each of the three experimental conditions

Condition 1	Condition 2	Condition 3
[Redacted content]		

Source (adapted): www.touristmaker.com/austria/

TE RAUEMI TUATORU: KEI HEA NGĀ MINENGA?

I te tau 2021, i kitea i te rangahau a Irirangi Te Motu, kei mua tonu ngā rangatahi o Aotearoa e haere ana i ngā mahi whakarere i ngā arapāho o mua. E tere tonu ana te whanake o Netflix, engari ko te pouaka whakaata tonu te arapāho nui katoa e whāia ana e ngā tāngata o Aotearoa, ina tirohia te tapeke whānui i te rā kotahi. Kua whakarāpopotohia ngā hua o te rangahau i te Ata 3.

Te tukanga

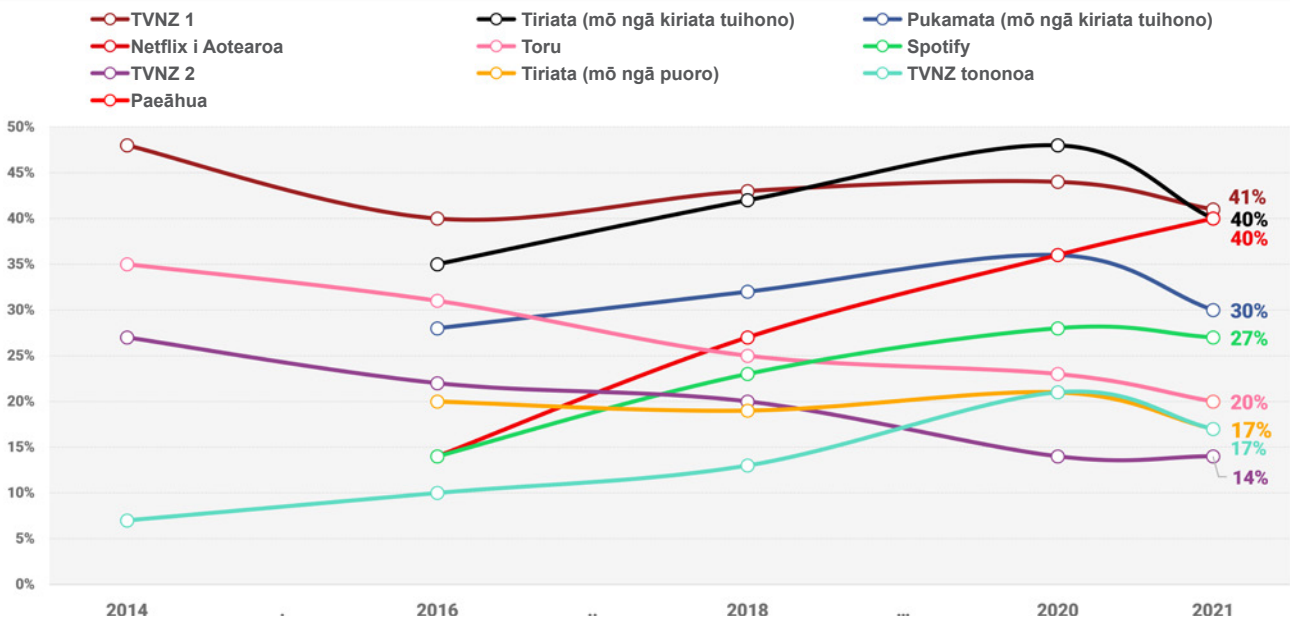
I whakahaerehia ngā uiui mā te waea, mā te waea i ngā tau matapōkere, ā, i whakaotingia i te ipurangi mā te pae rangahau o Flybuys nā Consumer Link. I whakahaerehia ngā uiui ā-ipurangi me ngā tāngata o Aotearoa kāore ā rātou waea i te kāinga, ā, i whakahaerehia mai i te 27 o Āperira ki te 24 o Mei, 2021. Ko te taupori whāiti e whāia ana, ko ngā tāngata o Aotearoa 15 tau te pakeke, e pakeke ake ana rānei. I whai wāhi atu hoki ki te tukanga tīpakonga tētahi tīpakonga kāhui ā-rohe, me ngā rahinga mōkito mō ngā tāne, kei waenganui i te 15-24 tau te pakeke, mō ngā rōpū mātāwaka hoki. I inea-tōmuritia te tīpakonga katoa ki ngā take o te whai wāhi ki te waea, o te ia, o te pakeke, o te mātāwaka hoki, e tika ai te whakakanohitia o te taupori o Aotearoa 15 tau te pakeke, e pakeke ake ana rānei.

I whai te ara rangahau kia ōrite ngā tukanga, ngā tukanga tīpakonga, te rere o ngā pātai, me te takoto o ngā kupu ki ērā o ngā rangahau katoa o mua. Ko tētahi o ngā tino rautaki i whāia, ko te pātai ki ngā kaiwhakautu pātai mō ō rātou whanonga “inanahi”.

Te Ata 3: Ngā hōngere, ngā pae tukutuku, me ngā teihana arotini katoa

Ngā hōngere, ngā pae tukutuku, me ngā teihana arotini katoa - te katoa o Aotearoa 15+ te pakeke

Q: Ko tēhea o ēnei i whakamahia rā e koe inanahi?



Te mātāpuna: <https://www.nzonair.govt.nz/research/where-are-audiences-2021/>

RESOURCE THREE: WHERE ARE THE AUDIENCES?

The 2021 New Zealand on Air survey has found that young New Zealanders are continuing to lead a march away from traditional media. Netflix is still growing at pace, but TV is still the media New Zealanders spend the most time with overall in a day. Survey results are summarised in Figure 3.

Methodology

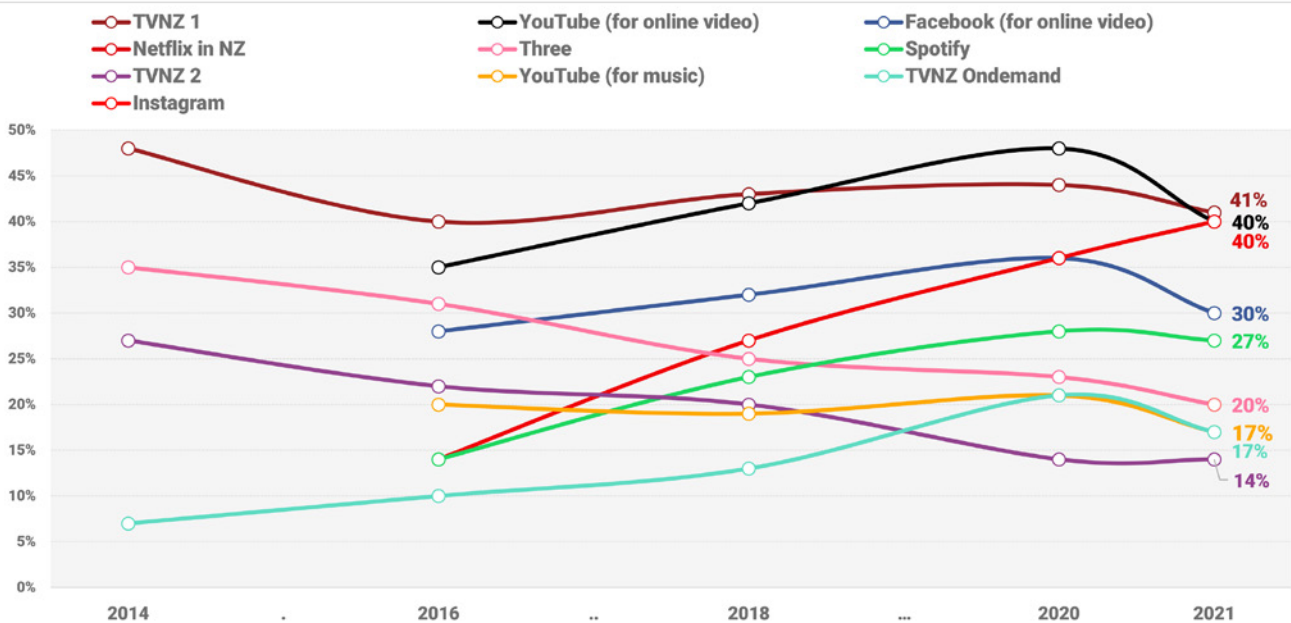
Interviews were completed by telephone using random digit dialling and were completed online using Consumer Link's Flybuys research panel. The online interviews were conducted among New Zealanders without access to a home landline, with all interviews conducted between 27 April and 24 May 2021. The target population was defined as all New Zealanders aged 15 and over. The sampling method included regional sample stratification, and minimum quotas for males, 15–24 year olds, and ethnic groups. The total sample was post-weighted by factors of access to a landline, gender, age, and ethnicity to ensure it was representative of the New Zealand population aged 15 and over.

The research approach aimed to keep methodology, sampling methods, question flow, and wording consistent with all previous studies. One key technique used was asking respondents about their behaviour “yesterday”.

Figure 3: Most popular channels, sites, and stations

Most popular channels, sites & stations – all New Zealanders 15+

Q: Which of the following did you use yesterday?



Source: <https://www.nzonair.govt.nz/research/where-are-audiences-2021/>

English translation of the wording on the front cover

Level 3 Mathematics and Statistics (Statistics) 2023

91584M Evaluate statistically based reports

Credits: Four

RESOURCE BOOKLET

Refer to this booklet to answer the questions for Mathematics and Statistics (Statistics) 91584M.

Check that this booklet has pages 2–7 in the correct order and that none of these pages is blank.

YOU MAY KEEP THIS BOOKLET AT THE END OF THE EXAMINATION.