Examine one rock from each of the following three groups.

(a) *JB-10 or *WS-19
(b) *W-11 or *W-12
(c) *JB-8 or *WS-13

Describe the hand specimen including texture, mineralogy, and field name. Describe the thin section including mineralogy, estimated mode (volume percent for all minerals present), IUGS classification (based on volume percentages of quartz, alkali feldspar, and plagioclase normalized to 100%), grain size, texture, etc. Please include a labeled photomicrograph for each rock to improve your description and to let me know what you are seeing. Prepare a short summary for each rock with this information. Be sure to include brief reasons (color, form, optical data, texture, etc.) for your mineral identifications. Lab reports should be submitted as files via Moodle, preferably as a single .pdf format file. If you need to send several files, put them all in one folder and use the “Compress” command to create a single “.zip” file of the folder and all its contents. Your filenames should begin with your initials or your name, e.g. “JBB_Granites.pdf”.

(Note: The dark minerals in group (c) are aegirine (=augite with acmite component) and arfvedsonite (=hornblende with riebekite component).

Additional advice:

To name an igneous rock, you must distinguish between alkali feldspar and plagioclase feldspar. If you have a single (not perthite) potassium feldspar (“K-spar”), it will be either sanidine (volcanic rocks only), orthoclase, or microcline. The difference is ordering of Al and Si on the tetrahedral sites of the feldspar structure. In most cases, there will be either microcline or orthoclase, but not both. Microcline “tartan” twinning can look many ways, depending on the orientation of the grain. Orthoclase “hides” in granitic rocks and can be confused with quartz. An interference figure may help tell quartz from orthoclase. Perthite (and anti-perthite) count as alkali feldspar. Perthite will be a mixture of orthoclase and albite or of microcline and albite.

The mode of a rock is the volume percentages of all the minerals. For each mineral, you should list its volume percentage, and the total should be 100%.

When you include a photomicrograph, be sure to include a scale bar or to give the width of the field of view. Stating the magnification is not particularly meaningful if the document can be viewed at different magnifications on a screen or printed at different scales. The same applies to giving the objective lens information. There are other lenses in addition to the objective lens that affect the magnification, as does the screen magnification.
Comparison chart for estimating volume percentages of constituents in rocks and concentrates in the range of 1.0 to 0.1 volume percent

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Abstract
Charts were prepared to aid the visual estimation of trace and accessory constituents in the range of 1.0 to 0.1 volume percent. The charts assist accurate and consistent estimates in this range for hand specimens, microscope slides, and heavy mineral concentrates. Applications include economic geology, sedimentology, and petrology.

Chart documentation
The visual estimation of the volume percent of accessory and trace minerals is important in economic geology, sedimentology, and petrology. Most workers tend to overestimate small percentages (particularly in the case of highly conspicuous minerals like mica); comparison with these charts may help to reduce such errors.

Previous charts (Folk, 1951; Shvetsov, 1954; Terry and Chilingar, 1955) aided visual estimates of essential constit-
Fig. 3. Comparison chart for estimating percentage composition in the range of 0.4 to 0.25 volume percent for coarse and fine grains.

Fig. 4. Comparison chart for estimating percentage composition in the range of 0.2 to 0.1 volume percent for coarse and fine grains.

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References

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